NATIONAL METAL CONGRESS AND EXPOSITION ISSUE

The Metals REVIEW

OWNED AND PUBLISHED BY THE MEMBERS OF THE AMERICAN SOCIETY FOR METALS

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THE MONTHLY SURVEY AND DIGEST OF WHAT'S NEW IN METALS

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MELLON INSTITUTE LIBRARY OCT 6 1944 PITTSBURGH, PA.

Panels of Experts To Lead 24 Meetings On Timely Topics

Panel meetings that bring together a group of experts and consultants unmatched in the history of American engineering societies will be continued at the National Metal Congress in Cleveland Oct. 16 to 20. These informal open forums on topics of the times are sponsored by the American Society for Metals during the afternoons and evenings of convention week and are held at the public Auditorium; all of the A.S.M. technical and scientific papers will be presented in morning sessions at the Statler Hotel. The complete list of 24 meetings will be found on page 3.

Meetings Grow in Popularity

It may be recalled that these Group Meetings were first tried at the Philadelphia Metal Congress in 1941. They were an instant success. The metallurgical industry at that time was converting for a war we did not know was in the immediate future. Nevertheless, there were even then many pressing problems concerning materials, short in quantity, and methods of making things that have no counterpart in peacetime commerce. These Group Meetings, wherein each of the experts in the panel discusses briefly some phase of the problem under consideration, gave the audience the benefit of right-up-to-the-minute thought and development. The plan of organization, indeed, was so adaptable that meetings were planned and organized to consider topics which had become important within the previous month.

At each of the annual Congresses since that time,

(*Continued on page 3*)

PASS-A-ROUND

This issue of THE METALS REVIEW contains the complete program of the National Metal Congress and War Conference Display, and is being mailed to 50,000 members of the engineering profession interested in metals. Some of you may receive two or three copies, so please pass them along to any associates in your company who may be interested in the program of the National Metal Congress.

Name	Item No.	Check

A Message

To the Members of the American Society for Metals and Cooperating Societies in the National Metal Congress and War Conference Display

THE FUTURE of the metal industry is now more than ever before a matter of vital concern to industrialists and technologists alike. Problems of reconversion with all their attendant minutiae of technical detail loom large this fall. How best to utilize and adapt the tremendous technological advances resulting from the stress of war is another matter much in the minds of technical and research men. Secretary Eisenman's selection of the theme "Design for Tomorrow" is therefore particularly appropriate as the basis of the National Metal Congress and War Conference Display, to be held in Cleveland Oct. 16 through 20, 1944.

At that time members of five great national societies will gather for technical programs and lectures, round table and panel discussions, and the largest exhibit of operating equipment, processes, products, and new material ever to be assembled in one place. It will provide a collecting point for all the vast and widespread developments of the defense and war periods, to be evaluated in the light of future civilian production.

The American Society for Metals, sponsor of the National Metal Congress in cooperation with the Iron and Steel and Institute of Metals Divisions of the American Institute of Mining and Metallurgical Engineers, the American Welding Society, the Society for Experimental Stress Analysis, and the American Industrial Radium and X-Ray Society, extends a cordial invitation to technical and research men, to executives and production men, to all who are interested in the future of the metal industry, to attend the 26th National Metal Congress and War Conference Display.

M A Grossmann

President, American Society for Metals

Cleveland's Huge Public Auditorium Will Be Taxed to Capacity by This Year's War Conference Display, Largest National Metal Exposition in History. The City's Four Finest Hotels Will Serve as Headquarters of the Five Cooperating Societies. (See complete index of events on page 2).

Metal Congress Will Have for Its Theme Design for Tomorrow

"Design for Tomorrow" will form the basic theme of the 26th National Metal Congress and War Conference Display opening in Cleveland Oct. 16, 1944. With five important technical societies joining to present a total of 163 papers and lectures and 31 round-table or discussion type meetings, and with nearly 400 leading firms in the metal field exhibiting the latest developments in processes, products and materials at Cleveland's mammoth Public Auditorium, this year's week-long Metal Congress will be the largest in the history of this annual event.

The congress is sponsored by the American Society for Metals with the cooperation of the Iron and Steel Division and Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers, the American Welding Society, the Society for Experimental Stress Analysis, and the American Industrial Radium and X-Ray Society. Each of these societies will have its own hotel headquarters and program of technical papers and meetings as outlined on the inside pages of this paper.

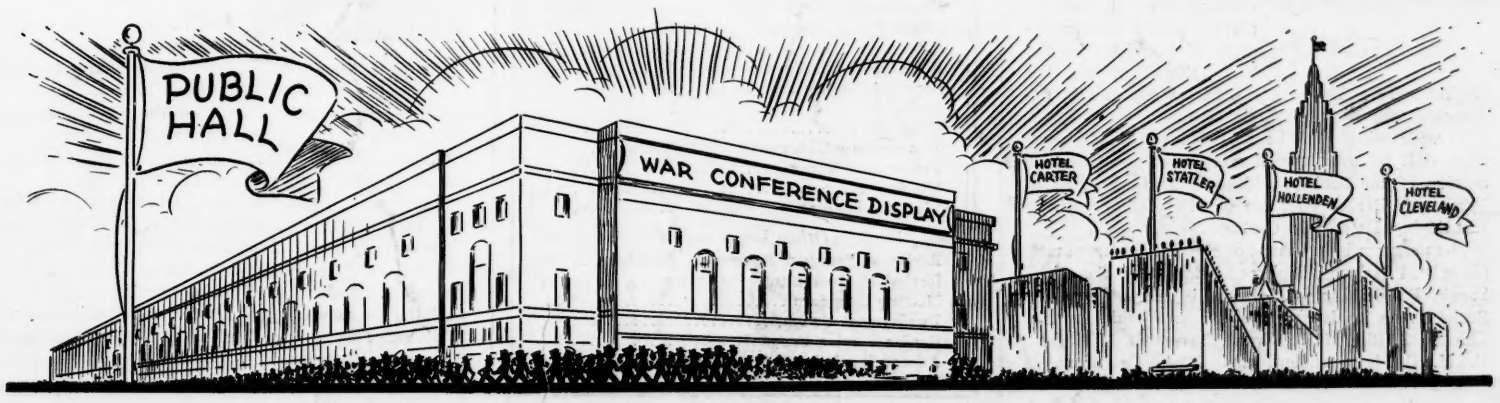
The entire affair will be tied together and supplemented by the War Conference Display in the Public Auditorium. Here nearly 400 displays (many of them with equipment in actual operation) will illustrate all the new developments in the field of metals that are resulting from the increased tempo of wartime manufacture and research. How these developments can be applied to future civilian production will be the main concern of the entire Congress—the "Design for Tomorrow."

Admission to the War Conference Display is free to all members of technical societies and to those holding invitations distributed by participating firms. Members of any technical society can register free upon presentation of their membership cards at the registration desk in the Public Auditorium. There will be no paid registration. The exhibits will be open from 12:00 noon until 10:30 p.m. daily, Monday through Friday, with the exception of Thursday, when they will close at 6:00 p.m.

A list of the firms participating in the War Conference Display with a brief description of what they will exhibit and the names of company officials who will be in attendance will be found on pages 26 to 39.

Fisher Furnace Co. Buys Monarch Rights

The industrial furnace business of the Monarch Engineering and Mfg. Co. of Baltimore, Md., has been purchased by the Fisher Furnace Co. of Chicago. The transaction gives the Fisher Furnace Co. all right to manufacture Monarch equipment and includes all patterns, drawings and parts inventories.



42 Papers Will Be Given At A.S.M. Technical Sessions

A dual program of morning technical sessions for the presentation of prepared research papers, and of afternoon and evening panel-type meetings for the informal discussion of current and timely problems in the metal industry will again be presented by the American Society for Metals during the National Metal Congress in Cleveland. Headquarters for the A.S.M. will be maintained jointly at both the Statler and Hollenden Hotels.

Forty-two papers will be presented at 12 sessions held simultaneously each morning during the week of the Congress. All of them have been preprinted and distributed to members requesting them. They will be read by the authors in brief abstract, each paper to be followed by presentation of written and oral discussion.

Original information will be presented on such timely subjects as sub-zero and heat treatment, induction heating, surface peening, hardenability, copper alloys, aluminum and magnesium alloys, new testing methods.

The complete program for the morning technical sessions is printed on page 5. Three simultaneous sessions will be held each day with the exception of Wednesday, Oct. 18, which is left open for the Annual Meeting of the American Society for Metals and the presentation of the Edward deMille Campbell Memorial Lecture by G. R. Fitterer, head of the department of metallurgical engineering at University of Pittsburgh.

All of the technical sessions will terminate promptly at 11:30 a.m. in order to permit attendance at the A.S.M. Victory Sessions—brief pre-luncheon talks by prominent Army, Navy and government officials.

The annual dinner of the Society will be held Thursday evening, Oct. 19, in the main ballroom of the Statler Hotel. Events scheduled for the dinner are outlined on page 6.

Important Notice!

IF YOU have not already reserved your hotel room for the National Metal Congress and War Conference Displays in Cleveland the week of Oct. 16, use the reservation form on page 17 of this issue and mail it immediately to the chairman of the Housing Bureau.

Accommodations for all who wish to attend the Congress have been assured through the facilities of this housing bureau, with the cooperation of the Cleveland Convention and Tourists' Bureau.

Radium and X-Ray Society To Meet Thursday and Friday

Twelve papers on various phases of industrial radiography are planned for the technical sessions of the American Industrial Radium and X-Ray Society, meeting in Cleveland Oct. 19 and 20 concurrently with the National Metal Congress. The sessions will be held Thursday morning and Friday morning and afternoon in the Hollenden Hotel, headquarters of the Society for the convention. Titles and authors of the papers are listed in the program on page 15.

George L. Clark
1944 Mehl Lecturer

On Thursday afternoon is scheduled the annual meeting of the Society, and election of officers, to be followed by the presentation of the Robert F. Mehl Lecture by George L. Clark, head of the department of chemistry at the University of Illinois. His subject will be "Experimental Stress Analysis in Radiographically Sound Materials."

These sessions will be preceded on Monday evening, Oct. 16, by a special meeting of the Cleveland Section of the Society, addressed by L. W. Ball of Triplett & Barton on "Use of Microradiography in Identifying Defects in Castings."

The program is in charge of Roy W. Emerson, metallurgist, Pittsburgh Piping and Equipment Co., Pittsburgh, Pa. Philip D. Johnson is secretary of the Society with headquarters at 25 E. Washington St., Chicago 2, Ill. M. B. Evans, Ternstedt Mfg. Div., G. M. C., is president, and J. A. Catanzano is treasurer.

A.I.M.E. Divisions Feature Symposia on Creep, Magnesium, Deoxidation, Dilatometry

Wm. A. Haven
Chairman
Iron & Steel Div.

James F. Lincoln
Dinner Speaker

Arthur Phillips
Chairman
Institute of Metals

For the 17th consecutive year the Institute of Metals Division and the Iron and Steel Division of the American Institute of Mining and Metallurgical Engineers will join with the other cooperating societies in the National Metal Congress by holding their regular fall meeting in Cleveland Oct. 16, 17, and 18, 1944. The headquarters for the A.I.M.E. will be the Statler Hotel, where the technical sessions and the annual dinner and reception will be held.

The high spot of the Institute of Metals Division technical program is the symposium on creep of nonferrous alloys arranged by Henry L. Burghoff, research metallurgist, Chase Brass and Copper Co. Also of much interest will be the session on grain size of magnesium. This is being arranged by E. A. Anderson, chief of the metal section, research department, New Jersey Zinc Co.

Two symposia will also feature the Iron and Steel Division sessions: One on deoxidation of open-hearth steel, arranged by T. S. Washburn, assistant chief metallurgist, Inland Steel Co., and chairman of the Division's Physical Chemistry of Steelmaking Committee; and one on recent developments in dilatometric analysis, arranged by F. M. Walters, Jr., superintendent of physical metallurgy, Naval Research Laboratory, Washington. A program of the papers to be presented at the various sessions is given on page 9.

The annual dinner will be on Tuesday evening, with Arthur Phillips, chairman of the Institute of Metals Division, as toastmaster. W. P. Sykes, chairman of the Cleveland Section, will welcome the members and guests, and William A. Haven, chairman of the Iron and Steel Division, will make the response. The dinner speaker will be James F. Lincoln, president of the Lincoln Electric Co.

The dinner will be preceded by a reception given with the compliments of local members of the Institute and arranged by the local committee under the chairmanship of Prof. K. H. Donaldson, Case School of Applied Science. Other members of the local committee for the Cleveland meeting are William A. Haven, Carl E. Swartz, W. P. Sykes, and C. L. Wyman.

Victory Sessions Will Be Addressed By Leaders in Services and Industry

Four "Victory Sessions"—brief, inspirational talks by nationally known leaders in industry and the Navy, Army Air Forces, and Ordnance Office—will fill an important half-hour in the morning program of the American Society for Metals during the National Metal Congress.

General Barnes

Major General G. M. Barnes, chief of the research and development service, Office of the Chief of Ordnance will give an address on Thursday morning, and Lt. Col. William Walter Phelps, Cleveland Area representative of the Army Air Forces, Materiel Command, is the speaker for Friday. Capt. T. A. Solberg, U.S.N., head of Research and Standards Branch, Bureau of Ships, is scheduled for Monday, and an industrial leader for Tuesday.

These Victory Sessions will convene at 11:30 a.m., immediately after the morning technical sessions of the A.S.M. They will all be held in the ballroom of the Statler Hotel.

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'Welding Aids the War Effort' Is Opening Theme of American Welding Society

"Welding Aids the War Effort" is the theme of the opening session of the American Welding Society's 25th Annual Meeting which will be held in Cleveland Oct. 16 to 19 during the National Metal Congress. At this session the Welding Society will be presented the Ordnance Distinguished Service Award, and three talks emphasizing the importance of welding in meeting the wartime needs of the nation will be delivered.

Welding as an aid in shipbuilding, ordnance equipment, and aircraft construction will be described respectively by Admiral H. L. Vickery, U. S. Maritime Commission, Col. S. B. Ritchie, Office of the Chief of Ordnance, and W. B. Stout of Consolidated Vultee Aircraft Corp., at the Monday morning session, following the presentation of medals and prizes.

A. B. Kinzel
Adams Lecturer

Sixteen technical sessions are planned, covering a wide variety of subjects such as weldability, aircraft, ships, railroad and transportation, machinery, piping and pressure vessels, foundry, structural welding, resistance welding, and three meetings devoted to general research in welding.

All meetings will be held on the mezzanine and lobby floors of the Cleveland Hotel, A.W.S. convention headquarters. The complete program of some 60 papers will be found on page 11.

The second annual Adams Lecture will be given Monday evening at 8:00 p.m. by A. B. Kinzel, chief metallurgist, Union Carbide and Carbon Corp., on "Solid Phase Welding." A University Research Conference is scheduled for Tuesday evening at 8:00 p.m., and the Section Officers' Dinner and Conference on Wednesday at 6:30 p.m. The convention will close Thursday afternoon, Oct. 17, with the Annual Business Meeting and Board of Directors' Meeting.

A. S. M. Group Discussion Meetings *

All Meetings in the Music Hall and Ballroom of the Public Auditorium, Cleveland

Monday, Oct. 16

2:00 P. M.
Metal Cutting and Tool Materials

2:00 P. M.
Light Weight Construction

4:00 P. M.
Sub-Zero Treatments

4:00 P. M.
Surface Finishes and Protection

8:30 P. M.
Induction Heating (Electronics in Overalls)

8:30 P. M.
What's New in the Study of Corrosion

Tuesday, Oct. 17

2:00 P. M.
The Hardenability Band as a Basis for Purchase and Use of Steel

2:00 P. M.
Magnesium

4:00 P. M.
Instruments for Quality Control
A—Measurement of Linear Dimensions

4:00 P. M.
Surface Peening to Increase Fatigue Resistance

8:30 P. M.
National Emergency Steels and Hardenability Specifications from the Consumer's Standpoint

8:30 P. M.
Tin; Tin Alloys; Tin Coatings

Wednesday, Oct. 18

2:00 P. M.
Metals for Railroads

2:00 P. M.
New Trends in Metallurgical Heating

4:00 P. M.
Products From Metal Powders

4:00 P. M.
Instruments for Quality Control
B—Means to Establish Identity

8:30 P. M.
Instruments for Quality Control
C—Detection and Measurement of Internal Defects

8:30 P. M.
Manufacture of Quality Steels

Thursday, Oct. 19

2:00 P. M.
Salt Baths

2:00 P. M.
New Aluminum Alloys for Peacetime Uses

4:00 P. M.
Quality Control by Statistical Methods

4:00 P. M.
Instruments for Quality Control
D—Measuring Devices for Atmosphere and Combustion

Friday, Oct. 20

2:00 P. M.
Heat Treatment

2:00 P. M.
Improved Gray Iron Castings

* Nationally known experts in the fields encompassed by these meetings will give brief talks on the various subdivisions of each topic. These men will then act as an information panel for open discussion and questions from the audience. Complete program, including subdivisions of each discussion topic and names of panel members, will be circulated to those attending the National Metal Congress. Program of A.S.M. technical papers, to be presenetd at morning sessions in the Statler Hotel, will be found on page 5.

Stress Analysis Society Has Four-Day Meeting

The Society for Experimental Stress Analysis, a new group meeting for the first time during the National Metal Congress, has prepared a four-day program of technical sessions and special meetings devoted to strain measurements and related problems, The meeting will open Tuesday, Oct. 17, at the Carter Hotel and adjourn Friday afternoon, Oct. 20. Complete program is given on page 13.

A special session on strain gage techniques is scheduled for Friday afternoon. A general review of the field will be presented by H. C. Roberts of University of Illinois, followed by an open forum and discussion. Prepared and spontaneous questions and answers will center around characteristics of amplifiers and galvanometers, calibration circuits, methods of recording, and use of crystals.

A symposium on crankshaft stresses will be held on Wednesday morning, and the annual dinner of the Society is scheduled for Thursday at 6:30 p.m.

The Society for Experimental Stress Analysis has offices in Cambridge, Mass. Prof. W. M. Murray of Massachusetts Institute of Technology is president, and the executive committee consists of M. Hetenyi, Westinghouse Electric & Mfg. Co., C. Lipson, Chrysler Corp., and R. D. Mindlin, Columbia University. Membership is available both to individuals and corporations, and can be secured by use of the form below.

Membership Committee
Society for Experimental Stress Analysis
P.O. Box 168, Central Sq. Station,
Cambridge 39, Mass.

Gentlemen:

Please enter my application for membership in the Society for Experimental Stress Analysis for one year, which includes Proceedings of two Symposiums.

Name .....

Street .....

City .....

Company ..... **Position** .....

(Yearly Membership Fee $5—Outside U.S.A. $6)

A Panel of Experts Exchanges Viewpoints

Tables and Microphones Conveniently Arranged on a Raised Platform or Stage Facilitate an Interchange of Ideas and Experiences Among the Leaders of a Panel Type Meeting. (Photograph taken at a previous National Metal Congress A.S.M. Group Meeting.)

Thirteen Technical Schools Sponsor Alumni Luncheons

University of Pittsburgh will join a group of leading technical colleges and universities this year in the annual Alumni Luncheons scheduled on Thursday, Oct. 19, during the National Metal Congress. Presentation of the A.S.M. Campbell Memorial Lecture on Wednesday by G. R. Fitterer, head of the department of metallurgical engineering at University of Pittsburgh, is expected to attract many of his former students to the lecture and the luncheon. The University intends, however, to make the Alumni Luncheon an annual event. The colleges holding alumni luncheons on Thursday are as follows:

Carnegie Institute of Technology
Case School of Applied Science
Lehigh University
Massachusetts Institute of Technology
Missouri School of Mines
Ohio State University
Pennsylvania State College
Purdue University
University of Illinois
University of Michigan
University of Pittsburgh
University of Wisconsin
Yale Metallurgical Alumni

The luncheons will be held at the Statler and Hollenden Hotels and tickets may be purchased at the A.S.M. registration desks at the Statler and at the Public Auditorium. All reservations must be made before six o'clock on Wednesday, Oct. 18 in order that the hotels may make adequate preparations.

24 Group Discussion Meetings Will Cover Timely Topics

(*Continued from page* 1)

these A.S.M. meetings have gained in importance and attendance, until last year the main ballroom at the Palmer House was continually crowded, often to "standing room only" limits. This year in Cleveland a similar interest is anticipated.

The meetings will be held in the "Music Hall" and "Ballroom", both within the huge structure that houses the exhibits of the War Conference Display. Both these halls have capacity for over 1000 persons, and are so situated that outside noises are excluded. Music Hall is entered by a passage leading from the stage in the Main Arena; the ballroom by elevators from the main entrance lobby. Direction signs will be posted and announcements made 15 min. prior to meeting times over the loud speaker system. All auditors are requested to arrive promptly.

This issue of THE METALS REVIEW has been sent to press before all details of the various programs shown above have been completed. While each of them has been outlined, the invitations have been issued to panel members so recently that responses and acceptances are only now being received. Nevertheless, all members and guests of the participating societies can be assured that the men who will be on the platform will be of national reputation in their respective fields.

A.S.M. REVIEW OF CURRENT METAL LITERATURE

An Annotated Survey of Engineering, Scientific and Industrial Journals and Books Here and Abroad, Received in the Library of Battelle Memorial Institute, Columbus, Ohio, During the Past Month

1. PRODUCTION OF METALS

1-93. **Smelting Magnesium.** Wilfred B. Griffin. *Light Metal Age*, v. 2, July '44, pp. 17-18.

Recommended methods for all phases of this operation; impurity tolerance, and the quality of metal to be expected.

1-94. **Degassing Aluminum.** James Erickson. *Light Metal Age*, v. 2, July '44, pp. 19-22.

Gases present in aluminum; the Al-H system (gas-metal alloy); entrance of gases into the metal; solubility of H and Ni in Al; methods for the removal of H from Al melts; degassing by the use of an inert gas: nickel; methods advocated for the removal of gases from aluminum and its alloys; chlorination; chlorides.

1-95. **Zinc Producer from Gold Prospect.** John B. Huttl. *Engineering & Mining Journal*, v. 145, July '44, pp. 82-84.

U. S. Smelting's Bayard property in New Mexico is contributing to metal output.

1-96. **Double Pick-Up Features New Magnetic Separator.** *Engineering & Mining Journal*, v. 145, July '44, p. 85.

Additional magnet bank said to give iron-ore concentrator approximately twice the capacity of a single-bank machine.

1-97. **Preheater Improves Results at Chino Smelter.** John B. Huttl. *Engineering & Mining Journal*, v. 145, July '44, pp. 92-93.

Better combustion in the reverberatory without supplementary burners. A higher over-all efficiency results.

1-98. **Emerald Tungsten.** *Mining World*, v. 6, July '44, pp. 15-18.

Second largest of six major tungsten projects of sound economic basis developed in North America during the war period closed by the Canadian government when war requirements were met, the character of its ore body establishes Emerald as a major factor in the post-war mineral production field.

1-99. **Iron Ore for California Steel.** F. Conrad. *Mining Journal*, v. 28, July 30, '44, p. 9.

Close to 2500 tons of iron ore are being shipped each day from the Vulcan to the Fontana, Calif., plant for conversion into steel plate.

1-100. **Postwar Prospects for Basic Electric Furnace Steel.** Frank T. Sisco. *Iron Age*, v. 154, July 27, '44, pp. 34, 35, 130, 132-134, 137.

Technology and economics of electric furnace steels.

1-101. **The Manufacture of Electric Furnace Pig Iron.** Charles Hart. *Steel*, v. 115, August 7, '44, pp. 111-114, 140.

Electric furnaces in Europe used for smelting iron ore are cylindrical crucibles with gas-tight tops. One day's output always remains in hearth and insures uniform metal at each cast. Highly basic slags are carried. One ton of pig made with 700 lb. of inferior fuel, 2000 kw. of energy and 2 man-hours of labor.

1-102. **Sponge Iron—Its Possibilities and Limitations.** C. F. Ramseyer. *Iron & Steel Engineer*, v. 21, July '44 pp. 35-44, 72.

Modern sponge iron processes; factors in the reduction of iron ore; use of fine ore; use of gas under pressure; hydrogen as a reducing gas; design factors; coke oven gas as source of hydrogen; the Herreshoff furnace with bottom slotted hearth; production and use of pure hydrogen; the bubble cap ore reduction furnace or column; comparison with blast furnace practice.

1-103. **The Cupola Method of Melting Bronze.** Charles R. Gregg. *Western Metals*, v. 2, August '44, pp. 24-25.

Controlling and measuring the air blast, measuring the coke bed height and amount used on charges, the melting or resulting temperature of bronze in the hearth can be closely controlled.

1-104. **A Survey of Slag Control Methods.** W. O. Philbrook and A. H. Jolly, Jr. *Blast Furnace and Steel Plant*, v. 32, August '44, pp. 938-942.

Five possible methods of estimating slag composition for open-hearth control purposes were investigated; the chemical analysis of the slag was used as the basis of comparison.

1-105. **Plant for Production of Magnesium by the Ferrosilicon Process.** Andrew Mayer. *Metals Technology*, v. 11, August '44, T. P. 1670, 14 pp.

Description of process, plant layout, equipment and operations, and flow sheets.

1-106. **Alumina from Clay by the Lime-sinter Method.** F. R. Archibald and C. F. Jackson. *Metals Technology*, v. 11, August '44, T. P. 1706, 12 pp.

The Ancor Process and its proposed application in treatment of clay, by the Defense Plant Corp.

1-107. **The Melting and Refining of Magnesium.** C. E. Nelson. *Metals Technology*, v. 11, August '44, T. P. 1708, 13 pp.

The practices commonly followed in this country for the melting and refining of magnesium and its alloys. 5 ref.

1-108. **The Kalunite Process.** Arthur Fleischer. *Metals Technology*, v. 11, August '44, T. P. 1713, 13 pp.

Production of aluminum; behavior of potassium alum; basic alum reaction.

1-109. **First Two Years Operation of the Bureau of Mines Electrolytic Manganese Pilot Plant at Boulder City, Nevada.** J. H. Jacobs, J. W. Hunter, W. H. Yarroll, P. E. Churchward and R. G. Knickerbocker. *Metals Technology*, v. 11, August '44, T. P. 1717, 21 pp.

A chapter in the history of the development of an electrolytic manganese industry in the United States; development of the process; the pilot plant; ore; crushing and grinding; roasting; leaching; purification; electrolysis; design of cell and frame; anodes; cathodes; diaphragms; solution concentrations; effect of cell pH; cell temperature; addition agents; effect of solution impurities. 7 ref.

1-110. **Climax Conversion Practice.** E. S. Wheeler. *Metals Technology*, v. 11, August '44, T. P. 1718, 11 pp.

Chronology of plant development; roasting department; production of ferro-alloys; chemicals.

Materials Index

To the Metal Literature Survey

THE FOLLOWING tabulation classifies the articles annotated in the preceding pages according to the metal or alloy concerned. The articles are designated by section and number. The section number appears in bold face type and the number of the article in light face.

General Ferrous

1-96-99-100-101-102-104; **3**-140; **13**-29; **16**-101-105-106-107-111; **17**-37-40-45-47; **18**-163-173-175; **22**-350; **26**-77-81; **27**-116.

Cast Iron

10-41; **14**-276-278-280-285-289; **22**-361; **25**-176.

Cast Steel

3-142; **12**-189-203; **14**-274-287; **16**-108; **18**-171; **22**-367.

Wrought Carbon Steel

3-141; **7**-78-79; **12**-200-202-206; **18**-164-165-169; **19**-227-228; **20**-303; **22**-349-357-359-364-379; **27**-108.

Alloy Steel

3-136-139-141; **10**-44; **12**-200-206; **14**-287; **18**-166-168-169-170-174-178; **21**-95; **22**-372-381; **23**-232-233-235; **25**-180; **27**-108.

Stainless and Heat Resisting Steel

21-91-93; **22**-358-373.

Tool Steels and Carbides

18-167; **20**-281-289-302-304-314; **22**-360-366-383.

Ferro-Alloys

1-110.

General Non-Ferrous

3-135; **8**-61; **14**-288.

Aluminum

1-94-106-108; **6**-39; **7**-78-80; **10**-42; **14**-270-282-290; **19**-223; **20**-278; **21**-94-99-103; **22**-351-355-365-378-382-384; **23**-229; **25**-178-180.

Magnesium

1-93-105-107; **12**-185; **14**-275-279; **19**-222-232; **20**-285; **21**-91-102; **22**-377-378; **26**-80; **27**-101.

Copper, Brass and Bronze

1-97-103; **3**-137-138; **4**-32; **5**-34; **9**-13; **10**-40-43-46; **16**-102; **17**-38; **20**-274; **22**-361-362-363-374; **23**-230-234-237; **25**-181.

Lead and Lead Alloys

6-38; **23**-237; **26**-76.

Tin and Tin Alloys

7-80; **8**-63; **14**-273.

Zinc and Zinc Alloys

1-95; **7**-79; **8**-65-66; **10**-42; **16**-104; **20**-291; **23**-230-231-236-239; **26**-76; **27**-98.

Miscellaneous and Minor Metals

1-98-109-110; **2**-32; **9**-14.

2. PROPERTIES OF METALS

2-32. **Refractory Metals: Their Manufacture and Use.** Claus G. Goetzel. *Mining & Metallurgy*, v. 25, August '44, pp. 373-375.

Tungsten, molybdenum, and tantalum, and their alloys, often in powder form, superior for many high-duty applications.

3. PROPERTIES OF ALLOYS

3-135. **Alloys of Thorium with Copper, Silver and Gold.** E. Raub and M. Engel. *Zeit. Elektrochemie und Angewande Physik. Chemie*, v. 49, no. 12, Dec. '43, pp. 479-486.

Phase diagrams of Th-Cu, Th-Ag and Th-Au. Specific properties of thorium alloys need more investigation for determination of these properties. In all three systems, two different combinations were observed with atomic ratio 3:1 and 5:3.

3-136. **Notes on Recent Trends and Uses of Alloy Steels.** B. B. Morton. *Mechanical Engineering*, v. 66, August '44, pp. 543-546.

Improvement of mechanical properties; heat treated alloys; fatigue; alloys for improvement of physical properties; alloys to resist corrosives.

3-137. **Car Axle Failures Traced to Absorption of Bearing Metal.** Frederick H. Williams. *Product Engineering*, v. 15, August '44, pp. 505-508.

Color photomicrographs reveal that railway car axles with journal-and-brass type bearings absorb Cu at temperatures produced by a "hot-box," thus causing embrittlement and often failure. Investigation based on earlier findings in the field of soldered and brazed joints in which weakening resulted from absorption of non-ferrous metals.

3-138. **Brasses, A.S.T.M. No. B36-43T, Alloys 1 to 8; B134-42T, Alloys 1 to 8; B135-43T, Alloys 1 to 5 (Materials Work Sheet).** *Machine Design*, v. 16, August '44, pp. 149-153.

Properties; physical constants; characteristics; applications; fabrication.

3-139. **Influence of Alloying Elements in Cr-Ni-Mo Steel.** *Iron Age*, v. 154, August 3, '44, pp. 65-67.

Data to show the influence of alloying elements on mechanical properties of a chrome-nickel-molybdenum steel, corresponding to the American SAE X4340 grade.

3-140. **Influence of the Metallurgical Treatment on the Durability of Ingot Molds.** Bela Koros. *Stahl und Eisen*, v. 64, no. 10, March 9, '44, pp. 159-164.

Influence on the durability of steel ingot molds. Determination of the most appropriate composition. Influence of the individual elements on the durability. Influence of heat treatment. The guiding analysis.

3-141. **The Influence of the Tempering Temperature on the Strength Properties of Molybdenum-Free Steel.** Alfred Krisch. *Stahl und Eisen*, v. 64, no. 7, Feb. 17, '44, pp. 105-110.

Investigation on 1¼ and 2¼-in. diameter rods of two plain steels with 0.43% C and 0.56% C, and 6 alloy steels with 0.16 to 0.50% C, 0.2 to 1.6% Si, 0.5 to 2.2% Mn, 0 to 2.5% Cr and 0 to 0.21% V, quenching in water or oil, and tempering at different temperatures, as to hardness, tensile strength, yield strength at 0.2 offset, ductility and notched impact, on the edge, core, and cross section of the test specimens. Grain size and Jominy hardenability data that should be supplied in order to rationalize the results are lacking.

3-142. **Impact Strength of Cast Steel.** Eugen Piwowarsky and Alfons Evers. *Stahl und Eisen*, v. 64, no. 9, March '44, pp. 142-144.

The effects of annealing time and temperature on basic O. H., basic electric, and O. H. and acid bessemer cast steels on impact behavior over a range of temperature from +385° F. to —20° F, were studied on plain carbon, on 0.12 to 0.50% Cr, and on 0.20 to 0.55 Cr, 0.23 to 0.31% Mo cast steels. Results for room temperature impact for each of the 12 steels are shown in solid diagrams for annealing times of ½, 1¾ and 4½ hr. at 1510, 1560, 1620 and 1670° F. Seven of the steels ran 0.28 to 0.32% C, the others 0.36 to 0.41% C. Phosphorus was about 0.065 in the acid O. H., 0.06 in the basic electric, 0.085 in the Bessemer and low in the basic O. H. Conclusions are drawn as to impact vs. method of melting, which need to be viewed in the light of the carbon and phosphorus contents. No information is given as to whether the heats were or were not aluminum treated, and grain size data are lacking. The behavior is what would be expected from the composition and treatment, irrespective of the method of melting. The tensile properties corresponding to the impact properties are not given.

3-143. **The Strength of Glued Sheet Metal.** N. A. De Bruyne. *Iron Age*, v. 154, August 24, '44, pp. 60-63.

Types of joints, possible strengths, and various design characteristics.

3-144. **Precipitation from Supersaturated Solid Solutions.** H. K. Hardy. *Light Metals*, v. 7, July '44, pp. 328-336, 337-348, 349.

A critical survey of the readily available information dealing with structural and property changes accompanying precipitation and with the effect of various factors on the rate of precipitation and the magnitude of the property changes undergone. 209 ref.

4. STRUCTURE

4-32. **The Preparation of Sections of Copper-Lead Alloys for Metallographic Examination.** R. W. K. Honeycombe. Australian Institute of Mining and Metallurgy *Proceedings*, no, 133, March '44, pp. 29-33.

Polishing technique; the etchant and the alloy composition; alternative method for alloys containing tin. 3 ref.

5. POWDER METALLURGY

5-34. **What Brass Powder Parts Offer the Designer.** E. H. Kelton. *Machine Design*, v. 16, August '44, pp. 129-132.

Machine parts made of sintered brass powder at considerable savings.

5-35. **Design of Powdered Metal Parts.** W. H. Arata. *Product Engineering*, v. 15, August '44, pp. 561-564.

Advantages, limitations, design data, general physical properties and typical applications of powdered metal parts are presented as a guide in the design of machine components.

5-36. **Presses and Processes for Metal Powder Products.** E. V. Crane and A. G. Bureau. *Canadian Metals and Metallurgical Industries*, v. 7, August '44, pp. 27-31.

Physical factors of the powders; pressure welding; processing for porous or dense products; porous bushing production; dense products. 7 ref.

6. CORROSION

6-38. **Corrosion Resistance of Electrodeposited Lead.** John F. Beall. American Electroplaters' Society *Monthly Review*, v. 31, August '44, pp. 719-723.

Limited use of lead plating due to the lack of published data on the advisability of lead coatings and the fact that there was no satisfactory solution commercially available.

6-39. **Aluminum in the Chemical Industries.** *Light Metals*, v. 7, July '44, pp. 352-358.

Tests for determining corrosion resistance in service and a comprehensive survey of the effects upon aluminum of a wide range of inorganic chemicals commonly encountered in chemical engineering practice.

(Continued on Page 7)

AMERICAN SOCIETY FOR METALS PROGRAM

Morning Technical Sessions, Hotel Statler (See Also Schedule of Panel Meetings at Public Auditorium, Page 3)

Monday, October 16

9:30 A.M.—Surface Hardening

Practical Aspects of the Selection of Frequency and Time Cycles for the Processing of Metallic Parts with Induction Heating, by W. E. Benningoff and H. B. Osborn, Jr., Ohio Crankshaft Co.

Induction Hardening of Plain Carbon Steels, by D. L. Martin and F. E. Wiley, General Electric Co.

Shot for Metal Peening, by O. E. Harder and J. T. Gow, Battelle Memorial Institute.

9:30 A.M.—Hardenability

Rates of Tempering in Cobalt Steels, by E. A. Loria, Carnegie-Illinois Steel Corp.

Isothermal Transformation and End-Quench Hardenability of Some NE Steels, by R. L. Rickett, J. G. Cutton, C. B. Bernhart, Jr., and J. R. Millikin, U. S. Steel Corp.

Further Developments of the End - Quench Hardenability Test, by C. R. Wilks, Earnshaw Cook and Howard S. Avery, Amer. Brake Shoe Co.

A Hardenability Test for Low Carbon and Shallow Hardening Steels, by O. W. McMullan, Youngstown Sheet & Tube Co.

9:30 A.M.
Non-Ferrous Metals

A Survey of Wrought Magnesium Alloy Fabrication, by J. V. Winkler, Dow Chemical Co.

The Copper - Manganese Equilibrium System, by R. S. Dean, J. R. Long, T. R. Graham, E. V. Potter and E. T. Hayes, Bureau of Mines.

Properties of Transitional Structure in Copper-Manganese Alloys, by R. S. Dean, E. V. Potter and J. R. Long, Bureau of Mines.

Age Hardening Copper-Manganese-Nickel Alloys, by R. S. Dean, J. R. Long, T. R. Graham and C. W. Matthews, Bureau of Mines.

11:30 A.M.—Victory Session

Tuesday, October 17

9:30 A.M.—Physical Properties

The Mechanism of Failure of 18 Cr, 8 Ni Cracking Still Tubes, by C. L. Clark, Timken Roller Bearing Co., and J. W. Freeman, University of Michigan.

Capillarity of Metallic Surfaces, by E. R. Parker, University of California, and R. Smoluchowski, General Electric Co.

The Effect of Fiber on Notched Bar Tensile Strength Properties of a Heat Treated Low Alloy Steel, by G. Sachs, J. D. Lubahn, L. J. Ebert and E. L. Aul, Case School of Applied Science.

The Effects of Notches of Varying Depth on the Strength of Heat Treated Low Alloy Steels, by G. Sachs, J. D. Lubahn and L. J. Ebert, Case School.

9:30 A. M.—Hardenability

The Effect of Carbon Content on Hardenability, by E. S. Rowland, J. Welchner, R. G. Hill and J. J. Russ, Timken Roller Bearing Co.

Air-Hardenability of Steels, by C. B. Post, M. C. Fetzer and W. H. Fenstermacher, Carpenter Steel Co.

The Partition of Molybdenum in Steel and Its Relation to Hardenability, by Fred E. Bowman, Climax Molybdenum Co.

The Rate of Diffusion of Molybdenum in Austenite and in Ferrite, by John L. Ham, Climax Molybdenum Co.

9:30 A.M.—Aluminum and Magnesium Alloys

New Developments in High Strength Aluminum Alloy Products, by E. H. Dix, Jr., Aluminum Co. of Amer.

Aluminum Alloy Forging Materials and Design, by L. W. Davis, Aluminum Company of America.

The Properties of Aluminum Alloys Melted in an Induction Heated Crucible Furnace, by James W. Poynter, Army Air Forces, Wright Field.

Magnesium Sheet, by P. T. Stroup and G. F. Sager, Aluminum Company of America, and J. B. West, American Magnesium Corp.

11:30 A.M.—Victory Session

Wednesday, October 18

7:30 A.M.—Chapter Chairmen's Breakfast

9:30 A.M.—Annual Meeting of the American Society for Metals

Ballroom, Hotel Statler

Election of Officers and Reports of the President, Secretary and Treasurer

Edward de Mille Campbell Memorial Lecture, by G. R. Fitterer, Professor and Head, Department of Metallurgical Engineering, University of Pittsburgh.

12:00 M.—Canadian Luncheon

Thursday, October 19

9:30 A.M.—Melting and Special Alloys

A Comparison of Aluminum and Titanium Deoxidation for Preventing Strain Aging Embrittlement in Low Carbon Steel, by G. F. Comstock and J. R. Lewis, Titanium Alloy Manufacturing Co.

The Ar' Reaction in Some Iron-Cobalt Tungsten Alloys and the Same Modified With Chromium, by W. P. Sykes, General Electric Co.

The Basic Electric Melting Procedure for High Quality Alloy Steels, by A. L. Ascik, Sorel Industries, Limited.

9:30 A.M.—Tool Steel

The Dimensional Stability of Steel—Part I—Sub-atmospheric Transformation of Retained Austenite, by S. G. Fletcher and Morris Cohen, Massachusetts Institute of Technology.

A Study of Subzero Treatments Applied to Molybdenum - Tungsten High Speed Steel, by R. G. Kennedy, Jr., Cleveland Twist Drill Co.

Experiments of Sodium Cyaniding of High Speed Steel Prior to Hardening, by John McIntyre, International Business Machines Co.

9:30 A.M.
Radiography and Testing

A Comparison of Microhardness Indentation Tests, by Douglas R. Tate, National Bureau of Standards.

Improved Sensitivity in Double Exposure Radiography, by James Rigbey, Ford Motor Company of Canada.

The Interpretation of Radiographs: Particularly of Aircraft Parts, by Leslie W. Ball, Triplett & Barton, Inc.

11:30 A.M.—Victory Session

12:00 M.—College Alumni Luncheons

7:00 P.M.—Annual Dinner of the American Society for Metals

Friday, October 20

9:30 A.M.—Chromium and Molybdenum Alloys

Chromium Steels of Low Carbon Content, by Russell Franks, Union Carbide and Carbon Research Labs.

Characteristics and Properties of Some Cast Chromium-Molybdenum Steels, by N. A. Ziegler and W. L. Meinhart, Crane Co.

The Segregation of Molybdenum in Phosphorus Bearing Alloyed Gray Cast Iron, by F. B. Rote, Wyman-Gordon Co. and W. P. Wood, University of Michigan.

9:30 A.M.—Fracture and Grain Size

Fractography—A New Tool for Metallurgical Research, by Carl A. Zapffe and Mason Clogg, Jr., Rustless Iron and Steel Corp.

Cleavage Structures of Iron-Silicon Alloys, by Carl A. Zapffe and Mason Clogg, Jr., Rustless Iron and Steel Corp.

Grain Shape and Grain Growth, by David Harker, General Electric Co., and Earl R. Parker, University of California.

Fracture Studies of Soldered Joints, by F. Berman and R. H. Harrington, General Electric Co.

9:30 A.M.—Rolling and Graphitization

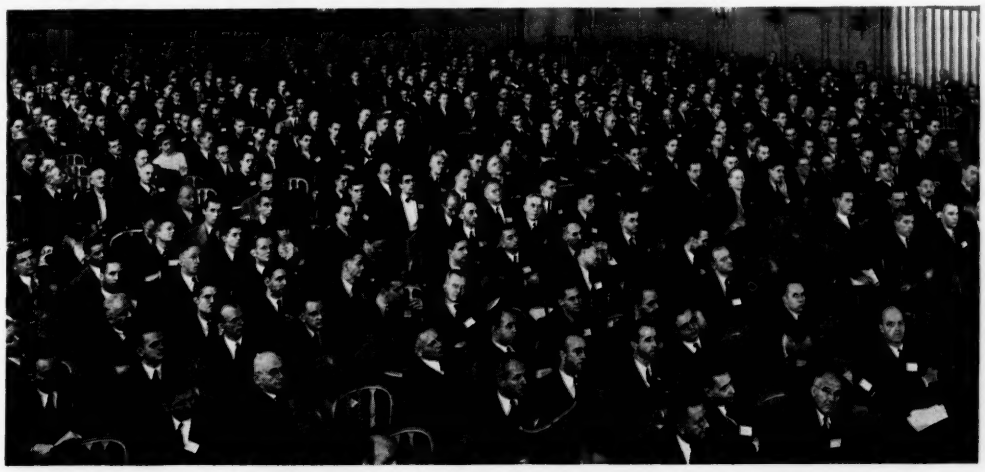
Annealing Studies on Cold-Rolled Iron and Iron Binary Alloys, by C. R. Austin, L. A. Luini and R. W. Lindsay, Pennsylvania State College.

The Effect of Cold Rolling on the Structure of Hadfield Manganese Steel, by Norman P. Goss, Cold Metal Products Co.

Factors Controlling Graphitization of Carbon Steels at Subcritical Temperatures, by C. R. Austin, Pennsylvania State College, and M. C. Fetzer, Carpenter Steel Co.

11:30 A.M.—Victory Session

A Typical Group at an A.S.M. Meeting



This Photograph of an A.S.M. Discussion Group Meeting at Last Year's Metal Congress in Chicago Is Indicative of the Wide Interest Taken in These Open Forums. Twenty-four such meetings will be held during this year's Congress in Cleveland, Oct. 16 to 20, on various timely and important subjects.

A.S.M. to Be Given Ordnance Award

For outstanding contributions to ordnance progress during the course of the War the Ordnance Distinguished Service Award has been granted to the American Society for Metals by the War Department. Presentation of the Award, which is a diploma bearing the traditional seal of the Department and is given in recognition of scientific and engineering achievement, will be made at the annual dinner of the Society on Oct. 19 at the Statler Hotel in Cleveland by Major General G. M. Barnes, chief of the research and development service, office of the Chief of Ordnance.

Assistance rendered by the American Society for Metals to the Ordnance Department has been along many lines, one of the earliest achievements being in the field of training inspectors. This was accomplished by means of lecture courses presented by all of the A.S.M. local chapters in territories where such inspectors were vitally needed, and by means of a book on "Inspection of Metals" written by Harry B. Pulsifer under the authorization of the A.S.M. and published and sold at cost.

Another field of assistance was developed in A.S.M. meetings and conventions. All of the programs for the National Metal Congress since 1940 have included one or more sessions presented in cooperation with the Ordnance Department or the local Ordnance District where the convention was held. Many chapters have likewise sponsored regional meetings in cooperation with the Army Ordnance Association devoted to the subject of production of ordnance material.

At the recommendation of the Board of Trustees 42 local chapters have formed A.S.M. War Products Advisory Committees since 1939, to give counsel or advice without cost or obligation to plants manufacturing war products and materials. Some 2445 problems have been presented and solutions provided or suggested by these committees.

Likewise the Society has provided free exhibit space at the annual National Metal Congress and has assisted the Ordnance Department in planning and executing educational displays. Such an exhibit will be provided again this year at the War Conference Display to be held in conjunction with the National Metal Congress in Cleveland.

I.A.A. Annual Business Meeting

The annual Business Meeting of International Acetylene Association will be held at a luncheon in the Euclid Room, Mezzanine Floor, Hotel Statler, Cleveland, on Oct. 18, 1944, at 12:15 noon.

Metal Powder Assoc. Meets Tuesday

The Metal Powder Association, a recently organized group of manufacturers of metal powders and products, will have a technical session during the National Metal Congress on Tuesday, Oct. 17, at 2:00 p. m. in Meeting Room A of the Public Auditorium. There will be a business meeting of the Association at the Statler Hotel on Wednesday morning, Oct. 18.

The Metals REVIEW
THE MONTHLY SURVEY AND DIGEST OF WHAT'S NEW IN METALS

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Ray T. Bayless.....*Editor*
M. R. Hyslop.....*Managing Editor*

Cleveland, Ohio—September, 1944
Volume XVII Number 9

Jominy Will Receive Sauveur Award At Annual Dinner

An important feature of the A.S.M. annual dinner on Thursday, Oct. 19, will be the presentation of the Albert Sauveur Achievement Award to Walter Jominy, chief metallurgist, Dodge Chicago Division of Chrysler Corp.

The A.S.M. Medal for the Advancement of Research will also be presented at this time to Robert C. Stanley, president of International Nickel Co. of Canada, Ltd. No award of the Gold Medal will be made this year. The Henry Marion Howe Medal for the best paper in TRANSACTIONS will be presented jointly to R. A. Flinn, Earnshaw Cook and J. A. Fellows of the American Brake Shoe Co., Mahwah, N. J., and the Past President's Medal to Herbert J. French, A.S.M. national president in 1942-43.

Walter E. Jominy

The dinner will be held in the ballroom of the Statler Hotel, Cleveland, and will be addressed by Major George Fielding Eliot on world military events.

The Sauveur Achievement Award, which recognizes "a metallurgical achievement which has stimulated other organized work along similar lines to such an extent that a marked advance has been made in metallurgical knowledge," will be a tribute to the work of Walter Jominy in developing the well-known end-quench hardenability test which bears his name. A pioneer in the field of hardenability, he devised the test that is now a standard for this all-important criterion of steel performance.

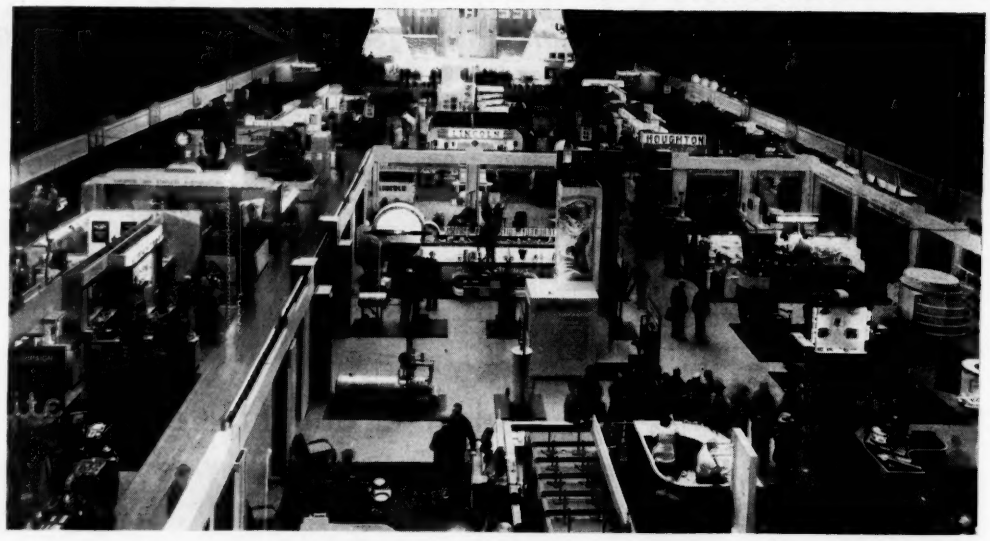
Mr. Jominy has been with Chrysler Corp. since 1941 and before that was for seven years metallurgist in the Research Laboratories Division of General Motors Corp. He has also done important work on scaling of steel during forging at University of Michigan's Department of Engineering Research (1923-31) and as research metallurgist for A. O. Smith Corp. (1931-34).

Tickets for the A.S.M. dinner will be $5.00 per plate, and tables will seat ten. Advance reservations should be sent to the American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.

Canadian Luncheon Wednesday, Oct. 18

The newly organized Ottawa Valley Chapter of the American Society for Metals will join the four other Canadian chapters in the annual "Canadian Luncheon" during the National Metal Congress. The luncheon will be held on Wednesday, Oct. 18, in the Lattice Room of the Statler Hotel, Cleveland, with members of the Montreal, Ontario, British Columbia, Manitoba, and Ottawa Valley Chapters participating. A special invitation is extended to "Friends of Canada" to attend. Tickets may be purchased at the registration desk at the Statler Hotel or the Public Auditorium on Monday and Tuesday, Oct. 16 and 17.

Main Arena, Cleveland Public Auditorium



This View, Taken at a Previous National Metal Exposition in Cleveland's Public Auditorium, Shows How the Main Arena Is Subdivided Into Exhibitors' Booths. The arena accommodates only 15% of the total War Conference Display, the other exhibits being housed in the underground exhibit halls.

New Departments Broaden Scope of Metals Review

Three new departments inaugurated last spring have made THE METALS REVIEW a complete news digest for the metal industry. For the first time, all developments in metals are rounded up and briefly reported in one magazine. These three departments are "The A.S.M. Review of Current Metal Literature," "New Products in Review," and "Manufacturers' Catalogs in Review."

The first of these provides a complete, up-to-the-minute survey of the engineering, scientific and industrial journals of the world, and consists of a classified list of articles that have appeared during the month just past, with brief annotations indicating their content or scope. Also, many articles containing important *new* information are abstracted separately at somewhat greater length.

Annotations to Be Made Into Book

THE METALS REVIEW, however, continues to carry reports of A.S.M. chapter meetings and other important gatherings; it therefore affords a complete coverage every month of technical and business magazines, books, equipment, parts, materials, catalogs and technical meetings.

So valuable has the A.S.M. Review of Current Metal Literature proved that plans are announced for its publication in book form at the end of the present year, thus providing a permanent reference work and bibliography on metals. The first volume will carry through next January's installment, thus including a complete year's annotations. Prepublication order forms at a special low price to members of the American Society for Metals will be included in the November and December issues of THE METALS REVIEW for ordering the bound volume.

Industrial Gas Men to Meet Oct. 18 For Breakfast and Round Table

The Industrial Gas Breakfast of the American Gas Association will be a feature of the National Metal Congress on Wednesday morning, Oct. 18. It will be held in the Assembly Room of the Hollenden Hotel at 8:30 a.m.

Harry K. Wrench, president, Minneapolis Gas Light Co., and chairman of the Industrial and Commercial Gas Section of the American Gas Association, will preside and greetings will be delivered by A.G.A. President J. French Robinson, president of the East Ohio Gas Co.; and also by an official of the American Society for Metals.

Professor W. Trinks of Carnegie Institute of Technology will headline an interesting program of prepared talks. These will be followed by a round table discussion on advanced uses of gas in metal treating and melting by leading engineers of gas utilities and manufacturers of industrial gas equipment.

All gas men, manufacturers of equipment, and those interested in modern heat treating methods and appliances are invited to attend the Industrial Gas Breakfast and Round Table.

Steel Chemistry Expert Is Campbell Lecturer

The 1944 Edward deMille Campbell Memorial Lecture of the American Society for Metals will be presented by George R. Fitterer, head of the department of metallurgical engineering at University of Pittsburgh, on Wednesday morning, Oct. 18, immediately following the annual meeting of the Society. The lecture will be held in the ballroom of the Statler Hotel.

G. R. Fitterer

While the subject of his lecture has not yet been announced, Dr. Fitterer is well known as an authority on physical chemistry of steel making. His researches have developed the widely used silico-manganese scavenging deoxidizers, the silicon deoxidation constant, the electrolytic extraction method for non-metallic inclusions, and the carbon-silicon carbide themocouple for liquid metals.

Dr. Fitterer holds degrees from Rose Polytechnic Institute, Carnegie Institute of Technology, and the University of Pittsburgh. He has been teaching at Pitt since 1935. Previously he had been employed by the U. S. Bureau of Mines as head of the metallurgy department at the Pittsburgh station. In 1934 he organized the Fitterer Pyrometer Co., of which he is a director at the present time.

Cook, Flinn and Fellows Will Receive Howe Medal

R. A. Flinn, Earnshaw Cook and J. A. Fellows of American Brake Shoe Co. will receive jointly the Henry Marion Howe Medal of the American Society for Metals for "the best paper to appear in the *Transactions* of the Society over a stated period of time."

Earnshaw Cook

Their paper, which was published in the March 1943 issue of *Transactions* under the title "A Quantitative Study of Austenite Transformation," described the development of new dilatrometric apparatus and the results of its application to determination of the martensite point and accurate delineation of the S-curve.

The medal will be presented on Thursday, Oct. 19, during the annual dinner of the A.S.M. at the Statler Hotel in Cleveland.

Earnshaw Cook is chief metallurgist, J. A. Fellows is assistant chief metallurgist, and R. A. Flinn assistant metallurgist of American Brake Shoe Co., Mahwah, N. J. Mr. Cook is the author of "Open-Hearth Steel Making," a book based on a series of lectures before the National Metal Congress in 1937.

Metal Literature Review—*Continued*

7. PROTECTION

7-76. Metal Treatment and Spray Painting at Lockheed. Fred M. Burt. *Products Finishing*, v. 8, August '44, pp. 24-26, 28, 30, 32, 34, 36.

A fully mechanized process for handling large quantity, quick production in a very efficient manner.

7-77. Spray Painting Pointers for Industrial Engineers. James A. Bede. *Products Finishing*, v. 8, August '44, pp. 58-60, 62, 64.

Objective in spray painting; factors in obtaining balanced atomization; preparation of material; rate of material flow; atomization adjustment; gun stroking; variation and balancing of interrelated factors; selection of material feeds; handling in spraying.

7-78. Protective Coatings for Aircraft Parts. *Iron Age*, v. 154, August 17, '44, pp. 72-73, 184.

Parkerizing and Bonderizing to protect iron and steel parts and anodizing and chromodizing for aluminum. Steps employed to impart corrosion resistance to aircraft components.

7-79. Influence of the Carbon Content of Steel Sheets on Their Ability to Be Zinc Coated by Hot-Dip (Fire) Method. Wilhelm Püngel. *Stahl und Eisen*, v. 64, no. 7, Feb. 17, '44, pp. 101-105.

Studies of the structure, formation, regularity of thickness, and adhesiveness of the zinc layer. Behavior of the zinc-coated steel sheets when prepared by the dry and wet ($ZnCl_2$ flux) methods, (a) sand blasted, (b) sand blasted and further heat treated 1 hr. at 750° C, and (c) sand blasted and then normalized, in bend, deep drawing, and alternating bend tests. Steels ranging from 0.06 to 0.74% C were used.

7-80. Metal Coating Facilitated by Ultrasound. *Iron Age*, v. 154, August 24, '44, pp. 59, 104.

German experiments whereby ultrasound is used to lay a coating of tin onto aluminum sheet. The same technique could, perhaps, be employed for the hot dipping of aluminum onto steel, or for a variety of other coating operations.

7-81. Supplemental Protection for Black-Oxide Finishes. Mark Weisberg and Edward A. Parker. *Industrial Heating*, v. 11, August '44, p. 1304.

Comparison of types of oils and waxes used.

8. ELECTROPLATING

8-61. The Chemistry of Electroplating. C. B. F. Young. *Products Finishing*, v. 8, August '44, pp. 44-46, 50, 52, 54, 56.

Phosphorus and alkaline earth families, and aluminum and silicon families studied.

8-62. Plastics in the Plating Industry. Harold Narcus. *Metal Finishing*, v. 42, August '44, pp. 470-474.

Synthetic rubber, when properly compounded, is suitable for practically all types of electroplating with the exception of chromium plating and can be used with almost every type of inorganic acid.

8-63. High-Frequency Generators for Fusion of Tin Plate. H. G. Frostick. *Steel*, v. 115, July 31, '44, pp. 90-92, 94.

Erection, adjustment and maintenance of high-frequency heating generators serving electro-tinning lines differ from the usual industrial electrical equipment. Stability of generator operation is a vital factor. Maintenance department considers vacuum tube generators and associated apparatus a part of their watch-care.

8-64. Plastic Material for Electroplating Shields. Harry W. Tompkins. *Aero Digest*, v. 46, July 15, '44, pp. 109-110, 112, 130.

Shields incorporate metal parts; shields for multiple plating; electrodes cast in shields.

8-65. Plating Practices of the Aircraft Industry. *Iron Age*, v. 154, August 10, '44, pp. 56-57.

The use of zinc plating has increased under the stress of cadmium shortages. Procedures for both operations are described including the plating sequences from precleaning and pickling through the actual plating operations and passivation.

8-66. The Formation of a Hard-Zinc During Zinc Coating by the Lead-Zinc Bath. Keinz Bablik. *Stahl und Eisen*, v. 64, no. 8, Feb. 24, '44 pp. 120-122.

The lead-zinc bath. Comparison of the pure-zinc bath method in relation to formation of hard-zinc. Relative activities of pure Zn and Zn-Pb alloys in forming Fe-Zn compounds.

8-67. The Fundamentals of Chemistry for Electroplaters. Samuel Glasstone. American Electroplaters Society *Monthly Review*, v. 31, August '44, pp. 699-702.

Metals and non-metals.

8-68. Apparatus for Automatic Control of Electrodeposition with Graded Cathode Potential. C. W. Caldwell and Robert C. Parker, and Harvey Diehl. *Industrial & Engineering Chemistry, Analytical Ed.*, v. 16, August '44, pp. 532-535.

Metal may be separated by cathodic deposition from a metal lying closely above it in the electro-motive series. Device consists of a vacuum tube amplifier which magnifies the cathode-calomel voltage sufficiently to actuate a relay and motor which drives a Variac; the Variac governs the size of an alternating current. 4 ref.

9. ELECTROMETALLURGY

9-13. A Study of the Possibility of Precipitation of Antimony as Oxychloride in Copper-Refining Electrolyte. Yu-Lin Yao. Electrochemical Society Preprint 86-1, 7 pp.

Chloride is an essential constituent of copper-refining electrolyte. Chlorides minimize the tendency for codeposition of antimony with copper. Evidences are given to show that this explanation is compatible with facts.

9-14. Manganese. D. D. Howat. *Mine and Quarry Engineering*, v. 9, August '44, pp. 187-193.

Electrolytic deposition of manganese by high acid process.

10. ANALYSIS

10-39. Ultra-Violet Light. Thomas S. Warren. *Mines Magazine*, v. 34, June '44, pp. 278-279, 282-284, 290.

Ultra-violet rays cause certain minerals to glow, a phenomenon called fluorescence, which has been taken advantage of in the identification of many minerals.

10-40. Determine Sulphur in Brass and Bronze by Combustion Method. Albert C. Holler and James P. Yeager. *The Foundry*, v. 72, August '44, pp. 83, 208, 210, 212.

Three steps in method: (1) Oxidation of the sulphides to sulphur dioxide; (2) formation of sulphuric acid; (3) titration of the sulphuric acid formed with a standardized sodium hydroxide solution. 12 ref.

10-41. The Determination of Sulphur in Cast Iron by the Combustion Method. W. J. Roskrow. *Foundry Trade Journal*, v. 73, July 6, '44, p. 198.

Reagents, method.

10-42. Determination of Zinc in Aluminum Alloys. W. Stross and G. H. Osborn. *Light Metals*, v. 7, July '44, pp. 323-327.

Comparative studies of electrolytic and polarographic determinations of zinc in aluminum alloys, particularly those of lower zinc content. 21 ref.

10-43. Recent Developments in Analytical Chemistry-X. *Chemical Age*, v. 50, June 24, '44, pp. 595-598.

Electrochemical deposition; determining Cu in ore; polarography of Cu; other methods for Cu; spectrography; the mass spectrometer; rubber analysis. 38 ref.

10-44. Colorimetric Determination of Chromium in Steel. Louis Singer and Walter A. Chambers. *Industrial & Engineering Chemistry*, Analytical Ed., v. 16, August '44, pp. 507-509.

A method based on the fact that ferric perchlorate, which is itself colorless, intensifies the color of the dichromate ion. The method is not subject to interference by iron or usual alloying constituents. 2 ref.

10-45. On Plate Calibration in Spectrographic Analysis. Saul Levy. *Optical Society of America, Journal*, v. 34, August '44, pp. 447-454.

Methods of photographic photometry; analytical representation of the characteristic curve; characteristic curves for plates of different contrasts; procedure for obtaining the basic curve; selections of lines; some experimental results.

10-46. Spectrographic Determination of Trace Elements in 70/30 Brass and Admiralty Brass. I. P. A. Leichtle. *Optical Society of America, Journal*, v. 34, August '44, pp. 454-463.

A spectrographic procedure for the simultaneous determination of Pb, Fe, Ni, Sn, Bi, and Sb in 70/30 brass and admiralty brass.

11. LABORATORY APPARATUS, INSTRUMENTS

11-85. Electronics in Industry. C. J. Madsen. *Iron & Steel Engineer*, v. 21, July '44, pp. 76-79.

Electronic tubes, handling currents ranging from thousands of amperes down to infinitesimal amounts, can amplify, generate, control, transform or convert electrical energy in almost any manner. Electronics, however, cannot do everything. Care should be exercised to avoid misapplication.

11-86. The Anderometer. Lucian Chaney, Edward Bragg, John Trytten, and Ernest Abbott. *Mechanical Engineering*, v. 66, August '44, pp. 515-518.

Instrument for production testing of ball bearings for deviations from circularity of balls and races.

11-87. Electric Gaging Methods for Strain, Pressure and Vibration. Howard C. Roberts. *Instruments*, v. 17, August '44, pp. 475, 484, 486, 488, 490.

Gaging methods based on variations of inductance.

11-88. Electronic Counting. Keith Henney. *Scientific American*, v. 171, Sept. '44, pp. 106-108.

A newly developed all-electronic counter.

11-89. Role of the Thermal Conductivity Cell in Aircraft Instruments. I. Michael A. Picciano. *Aero Digest*, v. 46, August 1, '44, pp. 108, 110, 144, 147.

The Fuel-Air Ratio Indicator makes it possible to ascertain the efficiency of the internal combustion engine to a degree which has never been matched by any other single instrument. 3 ref.

11-90. A Closed Cell for Electron Microscopy. I. M. Abrams and J. W. McBain. *Journal of Applied Physics*, v. 15, August '44, pp. 607-609.

Requirements for an enclosed chamber; preparation of collodion films; electron transparency of the film; mechanical mounting; liquid specimens in the electron microscope; Brownian movement and the electron microscope.

12. TESTING, INSPECTION AND RADIOGRAPHY

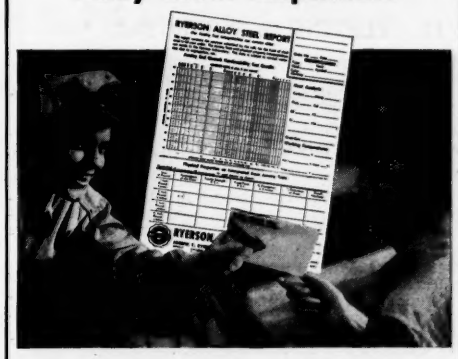
12-182. Jessop Steel Company Opens New Research and Metallurgical Laboratory. *Steel Processing*, v. 30, July '44, pp. 440-443, 452, 460.

General plan of building; planning and supervision; experimental melting and casting; experimental heat treatment; sample preparation; metallography; special testing; quality control—routine testing and statistical analysis.

12-183. Surface Roughness and Sliding Friction. J. J. Bikerman. *Reviews of Modern Physics*, v. 16, Jan. '44, pp. 53-68.

Methods of measurement methods involving a contact between solids; interface layers and their elimination; adhesion theory of friction; resistance to sliding and sliding friction; monomolecular layer of lubricant; thicker lubricating films; journal bearings. 126 ref.

Heat Treatment Data with Alloy Steel Shipments



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Metal Literature Review

12. TESTING & INSPECTION (*cont.*)

12-184. **Quality Control Inspection.** James Colasanti. *Mines Magazine*, v. 34, July '44, pp. 335-337.
Maintaining quality through statistical quality control.

12-185. **A Photo-Micrographic Case History in Magnesium.** M. H. Horton. *Light Metal Age*, v. 2, July '44, pp. 14-16.
A pictorial history of one plant's experiences with magnesium alloy. The manner in which photomicrography has exposed the cause of certain troubles. Exposes other conditions for which no explanations have as yet been found.

12-186. **X-Ray Absorption Coefficients.** C. H. Shaw. *Industrial Radiography*, v. 2, Spring '44, pp. 13-18.
Fundamental phenomenon behind the detection of flaws by radiographic methods. X-ray intensity; variation of intensity; linear absorption coefficient; use of the equation; mass absorption coefficient.

12-187. **Visualization of Angle-View Radiographic Technique.** L. P. Chartrand. *Industrial Radiography*, v. 2, Spring '44, pp. 18-19.
Description of a method intended to simplify the problem of finding the best technique and to facilitate its reproduction.

12-188. **New Developments and Applications of Fluoroscopic Examination of Metals and Assemblies.** Mario Iona. *Industrial Radiography*, v. 2, Spring '44, pp. 20-25, 28.
Handling of the specimen and general X-ray protection; the screen; human eye; X-ray protection at the screen. 6 ref.

12-189. **Radiography Aids Steel Casting Technique.** G. W. McLeary. *Industrial Radiography*, v. 2, Spring '44, pp. 29-32.
How radiography aided a foundry to obtain sound castings by exposing defects that were thought to be non-existent.

12-190. **Radiographic Specifications and Standards for Naval Materials.** Clyde L. Frear. *Industrial Radiography*, v. 2, Spring '44, pp. 33-36.
Requirements, process approval, radiographic standards.

12-191. **Industrial Fluoroscopy.** R. W. Mayer. *Industrial Radiography*, v. 2, Spring '44, pp. 37-39.
Uses, limitations, the personal factor.

12-192. **The A, B, C of Quality Control.** J. M. Juran. *Mechanical Engineering*, v. 66, August '44, pp. 529-535.
Specification, operation, and inspection.

12-193. **Rapid Hand Polishing of Micro Specimens.** Anton L. Schaeffler. *Metal Progress*, v. 46, August '44, pp. 285-287.
Technique for production control of hard alloys, utilizes emery papers, wax lap, and "Gamal on Gamal." The latter is an abrasive containing alumina in gamma crystallographic modification, and a cloth with especially fine, close pile.

12-194. **Applying Creep Data in Design.** Joseph Marin. II. *Machine Design*, v. 16, August '44, pp. 113-118.
Graphs giving the working stress value for particular values of the permissible creep are plotted.

12-195. **Automatic Recording of Data Speeds Structural Testing Work.** Albert Epstein. *Product Engineering*, v. 15, August '44, pp. 557-560.
Testing techniques developed by the structural research group of Republic Aviation Corp. that simplify the measurement of compression yield strength and compressive stress-strain properties of sheet or light extruded material and the determination of deflection in riveted and spot welded joints.

12-196. **Quality Control of Production and Laboratory Methods of Testing Oil Filters and Refills.** Walter J. Ewbank. *Diesel Progress*, v. 10, August, '44, pp. 69-72.
Major functions performed by the research laboratory.

12-197. **Trends in Modern Weld X-Ray Inspection.** Robert Taylor. *Industry & Welding*, v. 17, August '44, pp. 68, 70, 72, 99-102.
The principles of X-ray technique in inspection of varying sectional thicknesses of ferrous and non-ferrous fabrications.

12-198. **Inspection of Castings.** Richard V. Elms. *Purchasing*, v. 17, August '44, pp. 91-94, 266, 268.
Perfection is expensive, but rejections and substandard products are far more expensive in the long run.

12-199. **Spending and Saving the People's Money. VII. Inspections and Tests.** Mary E. O'Connor. *Purchasing*, v. 17, August '44, pp. 112-114, 276.
Only that which can be checked should be specified; no specification should be adopted that provides involved methods of testing for the acceptance or rejection of materials, unless there are facilities and funds available for making the tests.

12-200. **Selecting Steels on the Basis of Carbon Content.** A S. Jameson. *Steel*, v. 115, August 14, '44, pp. 94-98, 100.
Tensile test and microscopic data presented to show that in the selection of a steel for a particular application, the primary consideration is choice of proper carbon content. Data on effect of other alloying elements included.

12-201. **Metallurgical Laboratory Has Many New Features.** *Steel*, v. 115, August 14, '44, pp. 116-118, 174.
Microscope and dark rooms are pressure conditioned. Provision made for melting, forging and heat treating heats. Machine tools located in basement to afford freedom from vibration.

12-202. **The Occurrence, the Cause and the Elimination of Cracks in the Rail Base.** Reinhold Kuhnel. *Stahl und Eisen*, v. 64, no. 11, 12, March 16 and 23, '44, pp. 169-175, 187-194.
Statistical data covering the occurrences of cracks in rail bases. Static and dynamic bending tests of rail bases. Magnaflux determination of cracks and fissures in the new and used rails of Thomas- and Siemens-Martin steel. Crystal structure in occurrence of rail base cracks.

(Continued on Page 10)

Employment Bureau

Address answers care of American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio, unless otherwise stated. Applicants for the positions listed below are required to observe the rules and regulations of the War Manpower Commission regarding a statement of availability, if employed in an essential activity.

Positions Open

SALES MANAGER: For well-established engineering organization devoted to design and construction of specialized industrial electric, gas and oil fired heat treating furnaces. Preferably experienced in directing and obtaining sales of specialized heat treating equipment or kindred lines. Location New England. Box 10-5.

MAN to take charge of sheet metal fabrication plant located in western Pennsylvania employing 300 men. Excellent post-war future. Must be capable of taking full charge of production and of supervising all phases of sheet metal fabrication, as well as ability to act as tool engineer in setting up new production lines. Give complete details as to experience, education, draft status, etc. Box 8-30.

ASSISTANT METALLURGIST: Wanted by leading stainless steel industry in east, to supervise new creep testing equipment. College graduate, experienced in mechanical and metallurgical engineering, between ages of 24 and 35. Attractive salary and good working conditions. Box 8-75.

METALLURGIST: Permanent position with New York City precious metals firm as technician in development labratory. Powder metallurgy or brazing alloy experience desirable but not essential. State availability, education, experience, salary requirements, and references. Box 10-35.

SALES ENGINEER: Preferably with metallurgical or engineering background and some experience in brass mill production or brass mill sales. To handle Chicago sales office of prominent non-ferrous firm. Fixed salary with expenses. Box 10-40.

METALLURGICAL ENGINEER: Excellent post-war possibilities with a midwest firm. Should have sound fundamental knowledge and training in heat treating and processing ferrous metals. College degree preferred. Capable of conducting research projects. Box 10-45.

METAL BUYER: With metallurgical training and familiar with sources of supply of both commercial and special ferrous and non-ferrous metals and alloys. Box 10-50.

ENGINEERING SALES MANAGER: Preferably with engineering or metallurgical education and experienced in engineering sales of furnaces, heat resisting alloys, heat treating equipment, or specialty steels. Aggressive company with outstanding war record and 90% of customers using identical product in post-war. Base salary with bonus directly related to results. Location midwest. Application treated confidentially; our men know of this ad. Write fully including pre-war and war earnings. Box 10-55.

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Technicians
Metallurgist

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Positions Wanted

METALLURGIST: Twelve years' basic and stainless steel metallurgical experience. College graduate, B. S. degree. Present location Cleveland. Box 10-10.

METALLURGICAL CHEMIST: Eight years' experience in steel and light metals as spectrographer, metallographer, chemist and heat treater. Desires permanent position as metallurgist, laboratory supervisor, or researcher. Box 10-15.

METALLURGICAL ENGINEER: Six years' diversified experience in physical metallurgy and design, including physical testing, metallography, radiography, foundry and machine shop practice, heat treatment, and ferrous and non-ferrous research. Desires connection with consultant firm, or with manufacturer offering good post-war future. Can offer many contacts in Massachusetts to firm wishing to obtain new sources of business. Box 10-20.

SALES REPRESENTATIVE: Ex-service, experienced in metals, tools and electrical supplies, well known in Cleveland area. A-1 accounts only. Available October first. Box 10-25.

METALLURGIST: Engineering and metallurgical background. Experienced in supervision of metallurgical control laboratory, heat treat and electroplating. Desires position with definite post-war assurance located in southwest or Mexico. Minimum salary $9000. Box 10-30.

METALLURGIST: Graduate with eight years' industrial experience in production and research. Desires connection as chief metallurgist or supervisory capacity. Diversified knowledge and experience with both ferrous and non-ferrous metals. Recent experience includes design and organization of a complete metallurgical laboratory. Territory optional. Box 8-55.

FOR SALE—Homo Furnace, 800°, 250 D.C., 12 kw., with L & N Potentiometer, Motor Generator Set and G.E. Panel. Address Box 10-1, The Metals Review, 7301 Euclid Ave., Cleveland 3, Ohio.

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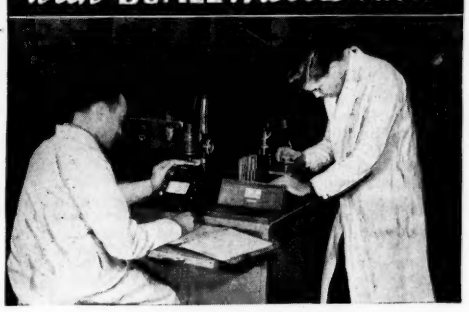

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PROGRAM OF A.I.M.E. METALS DIVISIONS

Annual Fall Meeting, Hotel Statler, Cleveland, Oct. 16, 17 and 18, 1944

INSTITUTE OF METALS DIVISION

Monday, October 16

10:30 A.M.—Pine Room, Hotel Statler

Magnesium

The Relationship Between Magnesium Core Sand Mixtures and the Burning of Magnesium, by O. J. Myers, Wright Aeronautical Co.

Solubility of Manganese in Magnesium, by N. Tiner, Permanente Metals Corp.

2:00 P.M.—Euclid Room, Hotel Statler

Grain Size of Magnesium

Grain Size and Properties of Sand Cast Magnesium, by R. S. Busk and C. W. Phillips, Dow Chemical Co.

Factors Affecting Grain Growth in Germination of Magnesium Alloy Castings, by A. T. Peters, R. S. Busk, and H. E. Elliott, Dow Chemical Co.

Grain Size of Sand Cast Magnesium Alloys, by Oscar Blohm, Hills-McCanna Company.

Tuesday, October 17

9:30 A.M. and 2:00 P.M.—Euclid Room, Hotel Statler

Symposium on Creep of Non-Ferrous Metals and Alloys

Chairmen—M. L. Burghoff and E. E. Schumacher.

Application of Non-Ferrous Alloys in Stress Design, by J. J. Kanter, Crane Co.

Creep Test Methods and the Interpretation of Creep Data, by P. G. McVetty, Westinghouse Electric and Mfg. Co.

Creep Characteristics of a Phosphorized Copper, by N. L. Burghoff and A. I. Blank, Chase Brass and Copper Co.

Creep Properties of Cold Drawn Annealed "B" Monel and Inconel, by B. B. Betty, H. L. Eiselstein and P. P. Huston, Jr., International Nickel Co.

Notes on the Elevated Temperature Properties of Some Cast Copper-Base Alloys, by H. E. Montgomery, The Lunkenheimer Co.

Creep Data on Die Cast Zinc Alloy, by E. H. Kelton and B. B. Grissinger, New Jersey Zinc Co.

Creep Properties of Some Rolled Lead Alloys, by A. A. Smith, Jr., American Smelting and Refining Co.

2:00 P.M.—Lattice Room, Hotel Statler

Non-Ferrous Production Metallurgy

Tin Smelting and Metallurgy, by C. L. Mantell, Consulting Chemical Engineer.

Beryllium, by Donald M. Liddell, Consulting Engineer.

Antimony: Its Metallurgy and Refining, by Chung Yu Wang, Wah Chang Trading Corp., and Guy C. Riddell, Consulting Mining Engineer.

Modern Quicksilver Reduction Plants, by G. I. Gould, H. W. Gould & Co.

7:00 P.M.—Euclid Room, Hotel Statler

Annual Fall Dinner, Metals Divisions

Wednesday, October 18

2:00 P.M.—Pine Room, Hotel Statler

General Session

Orientation Structure on the Surface of Cast Metals, by Gerald Edmunds, New Jersey Zinc Co.

The Hardness of Silver-Antimony Solid Solutions, by R. M. Treco and J. H. Frye, Lehigh University.

Substitute Solders of the 85-15 Lead-Tin Type, by James B. Russell, and J. O. Mack, Naval Research Laboratory.

Chester A. Fulton
President, A.I.M.E.

A. B. Parsons
Secretary

F. T. Sisco
Assistant Secretary

E. A. Anderson
Program Chairman, I. of M. Div.

Karl L. Fetters
Program Chairman, I. & S. Div.

IRON AND STEEL DIVISION

Monday, October 16

2:00 P.M.—Pine Room, Hotel Statler

General Session

Recovery of Cold Worked Aluminum-Iron as Detected by Changes in Magnetic Properties, by J. S. Stanley, Westinghouse Electric and Mfg. Co.

Distribution of Carbon Between Titanium and Iron in Steels, by W. P. Fishel and Bryson Robertson, Vanderbilt University.

Transformation of Austenite in a 3% Chromium 1% Carbon Steel, by E. P. Klier, Penn State College.

Tuesday, October 17

10:00 A.M.—Pine Room, Hotel Statler

General Session

Measurement and Control of Hydrogen Embrittlement in Type 440C Stainless Steel Wire, by C. A. Zapffe and M. Eleanor Haslein, Rustless Iron and Steel Corp.

Effect of Time Storage on Ductility of Welded Test Specimens, by C. E. Jackson and G. G. Luther, Naval Research Laboratory.

2:00 P.M.—Pine Room, Hotel Statler

Symposium on Recent Developments in Dilatometric Analysis

Chairmen—F. M. Walters, Jr., and Howard Scott.

Dilatometric Analysis of Sub-atmospheric Transformations, by R. D. Potter, Massachusetts Institute of Technology.

A High-speed Dilatometer and the Transformational Behavior of Six Steels, by A. L. Christiansen, E. C. Nelson, and C. E. Jackson, Naval Research Lab.

Precise Expansion Measurements on Non-Ferrous Alloys and Glasses, by W. E. Kingston, Sylvania Electric Products, Inc.

An Interference Type Dilatometer and Some Typical Results, by W. L. Fink and L. A. Willey, Aluminum Co. of America.

Wednesday, October 18

2:00 P.M.—Euclid Room, Hotel Statler

Symposium on Steelmaking

Chairmen—L. F. Reinartz and H. K. Work.

Theoretical and Practical Aspects of Deoxidation in Basic Open Hearth Practice, by T. S. Washburn, Inland Steel Co.

Slag-Metal-Oxygen Relationships in the Basic Open Hearth and Electric Processes, by J. S. Marsh, Bethlehem Steel Co.

A Rapid Laboratory Method for Estimating Basicity of Open-Hearth Slag, by W. O. Philbrook, A. J. Jolly, Jr., and T. R. Henry, Wisconsin Steel Works.

Application of pH Slag Basicity Measurements to Basic Open-Hearth Phosphorus Control, by Michael Tenenbaum and C. C. Brown, Inland Steel Co.

Special Breakfasts Planned for Chapter Chairmen, Technical Speakers

The annual A.S.M. Chapter Chairmen's Breakfast will be held Wednesday morning, Oct. 18, at 7:30 a.m. at the Statler Hotel, Cleveland, as a feature of the National Metal Congress.

The Board of Trustees will attend the Chairman's Breakfast and President Grossmann will preside. Topics of interest pertaining to the functioning of chapters will be presented for open discussion.

Daily breakfasts are also held during the National Metal Congress for speakers and chairmen on A.S.M. technical sessions. At these breakfasts the chairmen and co-chairmen of the technical sessions of that day and those who are presenting papers will meet with the chairman of the Publication Committee and A.S.M. Assistant Secretary Ray T. Bayless to discuss the details of operating the meetings. Similar luncheons and dinners will be given for those participating in the afternoon and evening panel discussion meetings.

Coordinating Committee on Corrosion Elects Three New Officers

Frank L. LaQue of the development and research division of the International Nickel Co. was elected chairman of the American Coordinating Committee on Corrosion at its sixth annual meeting held recently in New York. George H. Young and George W. Seagren, both of Mellon Institute of Industrial Research, were elected vice-chairman and secretary-treasurer respectively.

The Coordinating Committee, with headquarters at 4400 Fifth Ave., Pittsburgh, was organized in 1938 to serve as a clearing house and coordinating agency for information on American experience and American work in the field of corrosion.

J. E. Donnellan to Supervise Installation and Operation of Show

For the past 20 years the actual installation and operation of the exhibits at the National Metal Exposition have been under the efficient supervision of J. Edward Donnellan of the staff of the American Society for Metals. Last July Mr. Donnellan resigned to become vice-president in charge of sales for General Alloys Co., Boston, but his services are kindly being loaned back to the A.S.M. by General Alloys President Harry Harris so that he can superintendent the installation of this year's War Conference Display, which promises to be the largest Metal Exposition in the history of the event.

J. E. Donnellan

Mr. Donnellan is also continuing to serve as editor of the A.S.M. Metals Handbook and secretary of all its technical committees, until a successor is appointed.

Instruments for Quality Control Subject of Four Discussions

The general theme of the 26th annual Metal Congress,—"Design for Tomorrow"—is well supported by the emphasis placed on instruments for the control of quality. No less than four complete panels during the afternoons and evenings of convention week will discuss as many phases of the general topic. Titles and times of these group discussion meetings, all to be held at Public Auditorium, are as follows:

Instruments for Quality Control

A—Measurement of Linear Dimensions, Tuesday, Oct. 17, 4:00 p.m.

B—Means to Establish Identity, Wednesday, Oct. 18, 4:00 p.m.

C—Detection and Measurement of Internal Defects, Wednesday, Oct. 18, 8:30 p.m.

D—Measuring Devices for Atmosphere and Combustion, Thursday, Oct. 20, 4:00 p.m.

These unique discussions will devote a major share of attention, not to the tried and true and well-known equipment promoted commercially for so many years—although new ideas and adaptations of these will be given an appropriate hearing—but more especially to the specialized instruments that have been developed in this, that or the other plant for easy and accurate measurement. "To control a product it must first be measured" is the principle underlying all these new devices.

The program committee has had the advantage of the enthusiastic cooperation of John Quincy Adams, General Electric's watch dog on magnetic steels and alloys, whose acquaintance in this field is encyclopaedic. He, in turn, has called upon the resources of numerous societies of local or regional scope which are primarily interested in instrumentation. The whole subject is of such importance and dimensions that this pioneering presentation by the A. S. M. is but the opening gun of the campaign.

Resistance Welders Association Will Meet

The Resistance Welders Manufacturers Association will hold its regular monthly business meeting Thursday noon, Oct. 19, at the Cleveland Hotel, during the National Metal Congress. The Association will also be represented in booth D-336 at the War Conference Display.

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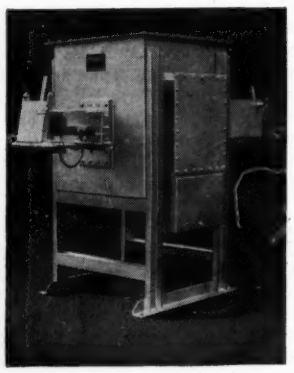

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Metal Literature Review—*Continued*

12. TESTING AND INSPECTION (*Cont.*)

12-203. **Relationship of Brinell Hardness and Yield Stress in Certain Cast Steels.** T. W. Ruffle. *Foundry Trade Journal*, v. 73, July 20, '44, pp. 227-231.
Brinell hardness test and yield stress as an acceptance test for steel castings. 2 ref.

12-204. **Torque and Thrust Measurements on Small Aircraft Engine Test Stands.** J. Liston and C. E. Schaefer. *Instruments*, v. 17, August '44, pp. 477-478, 480, 482, 484, 486, 488, 490.
Equipment and testing at Purdue University.

12-205. **The Fatigue Strength of Welded Joints.** Jonathan Jones. *Electrical Engineering*, v. 63, August '44, pp. 288-290.
Metals may fail in service as a result of repeated cyclical variations of stress. A research project, sponsored by the Welding Research Council of Engineering Foundation, has been conducted to investigate the endurance limits of welded joints. A summary of the progress and future plans. 8 ref.

12-206. **Variables Affecting the Results of Notched-Bar Impact Tests on Steels.** Clarence E. Jackson, Myron A. Pugacz and Frank S. McKenna. *Metals Technology*, v. 11, August '44, T. P. 1668, 17 pp.
Materials; test specimens; equipment for testing; tests and data. 12 ref.

12-207. **Gaging of Taper Pipe Threads.** Ralph J. Consler. *Aero Digest*, v. 46, August 1, '44, pp. 112, 114, 122.
Resume of the gaging procedure for tapered aircraft pipe threads.

12-208. **Importance of Film Processing in X-Ray Inspection.** Robert Taylor. *Aero Digest*, v. 46, August 1, '44, pp. 76-77, 122.
Defects; proposed equipment and system for proper development. 2 ref.

12-209. **Testing of Aircraft Generators.** H. E. Keneipp. *Aero Digest*, v. 46, August 1, '44, pp. 101-102, 104, 140.
Tests include raw material, parts, laboratory, life, mechanical, and flight tests; describes tests which have been made and the interpretations which have led to improvements in d-c aircraft generators.

12-210. **A Simple Vector Method for the Determination of Orientations of Cubic Single Crystals from Back Reflection X-Ray Photographs.** Beulah Field Decker. *Journal of Applied Physics*, v. 15, August '44, pp. 610-612.
Description of system and examples.

13. TEMPERATURE MEASUREMENT AND CONTROL (PYROMETRY)

13-29. **Liquid Steel Temperatures Measured by Thermocouple.** D. A. Oliver and T. Land. *Iron Age*, v. 154, July 27, '44, pp. 39-41, 124.
A method to give a true reading of temperature variations for liquid steel poured into a ladle by means of an immersion type thermocouple. The results permit this method to supersede the optical pyrometer.

13-30. **Electronic Control for Resistance Furnaces.** Harold J. Hague. *Steel*, v. 115, August 14, '44, pp. 106, 108, 162, 164, 166, 168, 170.
Method for accurately controlling temperatures of heat treating and other furnaces involves simple regulator system.

13-31. **Temperature Measurement of Molten Alloys.** *Alloy Casting Bulletin*, no. 2, July '44, pp. 1-3.
Melting points of HH and HT alloys determined at Battelle. Calibration curves given for obtaining true temperatures with optical pyrometers.

14. FOUNDRY PRACTICE AND APPLIANCES

14-270. **Wartime Calls on Women to Make Aluminum Air-Cooled Cylinder Heads.** M. J. Gregory. *Foundry Trade Journal*, v. 73, July 6, '44, pp. 187-196.
Women have proved more proficient in this type of work than men.

14-271. **Die Casting Provides a Flare for Bombing.** J. R. Putnam. *Die Casting*, v. 2, August '44, pp. 22-24, 60.
Handling operations involved in the production of the die cast M-111 A2 Flare Fuse.

14-272. **Design Rules. VI.** Herbert Chase. *Die Casting*, v. 2, August '44, pp. 30, 32-34.
Slender cores may well be avoided except where the die caster agrees that their use is feasible.

14-273. **Alloys for Die Castings. V. - Tin.** *Die Casting*, v. 2, August '44, pp. 47-49.
Advantages, limitations, composition and physical properties. Tin alloy die castings indispensable in contact with food and beverage products.

14-274. **Handling Materials in Crane Steel Foundry.** Erle F. Ross. *The Foundry*, v. 72, August '44, pp. 74-77, 182, 184, 186, 188.
Capacity increased by installing additional equipment, ingenious utilization of existing floor space and overall efficiency. Bucket charging saves time; equipment eliminates labor; castings are annealed; castings are checked.

14-275. **Magnesium Castings by Dodge Chicago Plant.** Wm. G. Gude. *The Foundry*, v. 72, August '44, pp. 78-81, 178, 180.
Production of magnesium castings.

14-276. **Cupola Practice.** Donald J. Reese. *The Foundry*, v. 72, August '44, pp. 82, 196, 198, 200.
Reasons for using cupola melting equipment, and basic principles which must be observed for successful operation.

14-277. **It Can Be Cast Centrifugally.** John Putchinski. *The Foundry*, v. 72, August '44, pp. 84, 85, 190, 192, 194.
Factors which determine the cost of manufacture or the comparative costs as related to the process of completing a part or casting from the raw material.

14-278. **Manpower Problems in Gray Iron.** Walter I. Seelbach. *The Foundry*, v. 72, August '44, pp. 109, 112, 156, 160, 162, 164, 168.
A review of the situation and possible remedies.

14-279. **Plastic Impregnation of Magnesium Castings.** *Iron Age*, v. 154, August 10, '44, p. 63.
A new synthetic resin claims advantages over tung oil as a casting sealer or impregnant. It is 100% nonvolatile compound, and has a viscosity of Y-Z on the Gardner-Holdt scale (18-23 poises).

14-280. **Desulphurisation of Cast Iron by Sodium Carbonate.** N. L. Evans. *Engineering*, v. 158, July 7, '44, p. 17.
Problems encountered.

14-281. **Ford's Centrifugal Casting Production Line.** *Machinery*, v. 50, August '44, pp. 144-151.
Development of centrifugal casting process; construction of spinning mold; advantages of centrifugal casting; centrifugal castings and forgings compared.

14-282. **Casting Rolls Royce Cylinder Blocks in Buick's $10,000,000 Aluminum Foundry.** William G. Mixer. *Machinery*, v. 50, August '44, pp. 162-169.
Description of pattern making, molding, melting, and casting practices employed.

14-283. **Foundries Prepare Castings for First Machining Operation.** John A. Macdonald. *American Machinist*, v. 88, August 17, '44, pp. 112-114.
Location bosses, provided for in original casting design, assure accuracy in first machining set-up and make possible complete inspection in foundry and in plant's receiving room.

14-284. **Mechanical Handling in Foundries. V, VI, VII.** *Foundry Trade Journal*, v. 73, July 20, '44, pp. 233-238.
The major stages in the handling of materials for the production of castings.

14-285. **Some Aspects of Technical Service Applied to the Iron Foundry.** H. Jackson. *Foundry Trade Journal*, v. 73, July 20, '44, pp. 239-240.
Liaison between producer and customer is a worthy aim.

14-286. **Spinning Speeds for Centrifugal Casting.** *Machinery* (London), v. 65, July 20, '44, pp. 71-73.
Determining the proper speed for horizontal centrifugal casting by a graph.

14-287. **Casting Alloy Steel for the Oil-Field Industry.** *Steel*, v. 115, August 21, '44, pp. 103-104, 106, 108, 154.
General picture of the more significant operations in making static castings.

14-288. **Metallurgy in the Non-Ferrous Foundry. IV. Test Bars.** A. C. Boak. *Canadian Metals and Metallurgical Industries*, v. 7, August '44, pp. 24-26, 31.
Value of test bars; factors to be controlled. 3 ref.

14-289. **Quality Control in the Foundry.** E. W. Harding. *Canadian Metals and Metallurgical Industries*, v. 7, August '44, pp. 39-40, 42, 44, 46.
Principles and experience in high duty iron production.

14-290. **Wartime Calls on Women to Make Aluminum Air-Cooled Cylinder Heads.** M. J. Gregory. *Foundry Trade Journal*, v. 73, June 22, '44, pp. 147-151.
Women have proved more proficient in this type of work than men.

15. SECONDARY METALS

15-23. **Conservation and Reclamation of Material for Maintenance of Way.** R. P. Winton. *American Railway Engineering Association Bulletin*, v. 46, June-July '44, pp. 1-36.
Tolerances for reclamation; gages important; Mn and rail-bound Mn frogs; procedure; switch stands; flame cleaning and oiling rails and joint bars.

16. FURNACES AND FUELS

16-98. **Control of Atmosphere in Open-Fired Furnaces.** F. A. Locke. *Iron Age*, v. 154, July 27, '44, pp. 36-38, 126, 128, 130.
Definite need for controlling the atmosphere in an open-fired furnace. Variables that must be controlled, the type of atmosphere most suitable and how the characteristics of various atmospheres may be judged.

16-99. **Guide to Furnace Selection.** D. H. Gardner. *Iron Age*, v. 154, August 3, '44, pp. 60-64, 138.
Determining the heating time required, the heating medium to be used, and from these, the type of furnace best suited for a particular heat treating operation with regard for the production required and the weight and size of the material to be heated.

16-100. **Efficiency of Induction Heating Coils.** George H. Brown. *Electronics*, v. 17, August '44, pp. 124-129, 382-385.
Examination of the action occurring in induction heating of metals, including analysis of current distribution in work coil and load, relation between frequency and coupling efficiency, impedance considerations and discussion of factors affecting choice of frequency.

16-101. **Platform at Iron Notch Protects Furnacemen.** *Steel*, v. 115, August 7, '44, p. 116.
Acts as a working platform while drilling out the tap hole and, in case of a break-through into the molten iron while drilling, deflects the flame or sparks into the space between its lower surface and the iron trough.

16-102. **Changes in Brass Furnace.** Thomas Henry. *American Foundryman*, v. 6, August '44, p. 7.
Cut melting time and waste by oxidation.

16-103. **Design of Electronic Heaters for Induction Heating.** J. P. Jordan. Institute of Radio Engineers *Proceedings*, v. 32, August '44, pp. 449-452.
Choice of the circuit to be used, the tank current, operating frequency, and the physical construction are dependent upon a knowledge of the theoretical and practical requirements of induction heating, and an understanding of the operating condition to be met in the average factory.

(Continued on Page 12)

PROGRAM OF AMERICAN WELDING SOCIETY

Twenty-Fifth Annual Meeting, Oct. 16-19, Headquarters at Hotel Cleveland, Cleveland, Ohio

Monday, October 16

9:30 A.M.—Opening Session

Chairman—David Arnott, President, A.W.S.
Vice-Chairman—E. V. David, Chairman, Convention Committee.
Presentation of Medals and Prizes.

Welding Aids the War Effort

Welding as an Aid in Shipbuilding Construction, by Admiral H. L. Vickery, U. S. Maritime Commission.
Welding as an Aid in the Fabrication of Ordnance Equipment, by Col. S. B. Ritchie, Office, Chief of Ordnance.
Welding in Aircraft Construction, by W. B. Stout, Consolidated Vultee Aircraft Corp.

2:00P.M.—Welding and Cutting in Heavy Industries

Admiral Vickery
Maritime Commission

Chairman—R. J. Yarrow, Republic Structural Iron Works.
Vice - Chairman — J. M. Driscoll, Air Reduction Sales Co.
Fundamentals of Heavy Cutting, by G. L. Walker and H. G. Hughey, Air Reduction Sales Co.
Steel Mill Maintenance, by E. W. Gruber, Wheeling Steel Corp.
Unusual Applications of Gas Cutting in Ordnance Fabrication, by C. M. Underwood, Northern Ordnance, Inc.
Procedure Control of Automatic Welding Processes, by A. E. Bedell and J. B. Quigley, Graver Tank & Mfg. Co., Inc.

2:00 P.M.—Railroad and Transportation

Chairman—J. W. Sheffer, American Car & Foundry Co.
Vice-Chairman—A. G. Oehler, Railway Age.
Welding of Aluminum Tank Cars, by A. H. Woollen, Railroad Sales, Aluminum Co. of America.
Railroad Welding, by John McMullen, Erie R. R.

2:00 P.M.—Weldability

Chairman—A. B. Kinzel, Union Carbide & Carbon Corp.
Vice-Chairman—C. H. Jennings, Westinghouse Electric & Mfg. Co.
Welding of Manganese Steels, by W. B. Brooks and A. G. Waggoner, Cramp Shipbuilding Co.
High Tensile Manganese-Silicon Steels for Welded Fabrication, by G. G. Luther and F. H. Laxar, Naval Research Lab.
The Bead-Weld Nick-Bend Test for Ductility, by C. E. Jackson and G. G. Luther, Naval Research Lab.
The Influence of Minor Variables of Weldability, by R. D. Stout, S. S. Tor and G. E. Doan, Lehigh University.

8:00 P.M.—Adams' Lecture

Chairman—W. F. Hess, Rennselaer Polytechnic Inst.
Vice-Chairman—R. H. Aborn, United States Steel Corp.
Solid Phase Welding, by A. B. Kinzel, Union Carbide & Carbon Corp.

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Tuesday, October 17

9:30 A.M.—Resistance Welding

Chairman—L. C. Bibber, Carnegie-Illinois Steel Corp.
Vice-Chairman—G. N. Sieger, S.M.S. Corp.
Spot Welding Machines for Heavy Gauges of Ferrous and Non-Ferrous Metals, by Mario Sciaky, Sciaky Bros.
Heat Transfer Across Contact Surfaces, by W. B. Kouwenhoven, Dean, School of Engineering, Johns Hopkins University.
Problems in Spot Welding Heavy Mild Steel Plate, by F. R. Hensel, E. I. Larsen and E. F. Holt, P. R. Mallory & Co., Inc.

9:30 A.M.—Research

Chairman—S. L. Hoyt, Battelle Memorial Institute.
Vice-Chairman—R. E. Kinkead, Consulting Welding Engineer.
The Effect of Postheating in Welding Alloy Steels, by M. A. Pugacz and G. J. Siegel, Naval Research Laboratory.
Stress Relieving Study, by Prof. J. R. Stitt, Ohio State University.
The Effects of Metallurgical Changes Due to Heat Treatment Upon the Fatigue Strength of Carbon-Steel Plates, by W. H. Bruckner and W. H. Munse, University of Illinois.

W. B. Stout

9:30 A.M.—Structural

Chairman—A. S. Low, The Austin Co.
Vice-Chairman—J. F. Maine, Republic Structural Iron Works.
Standard Details for Welded Building Construction, by H. W. Lawson, Bethlehem Steel Co.
Field Welded Pressure and Variable Volume Storage Tanks, by Fred L. Plummer, Hammond Iron Works.

2:00 P.M.—Resistance Welding

Chairman—R. E. Powell, Western Electric Co.
Vice-Chairman—H. C. Cogan, National Electric Welding Machines Co.
Low Reactance Cable for Portable Resistance Welders, by Myron Zucker, Mackworth G. Rees, Inc.
The Flash Welding of Alloy Steels—Welding Techniques and Variables, by J. J. Riley; **Metallurgical and Physical Characteristics,** by J. C. Barrett, Taylor-Winfield Corp.
Small Portable Condenser Welding Set, by E. M. Callender, E. G. Budd Mfg. Co.

2:00 P.M.—Research

Chairman—H. C. Boardman, Chicago Bridge & Iron Co.
Vice-Chairman—G. V. Slottman, Air Reduction Sales Co.
Some Recent Developments in Stainless Steel Welding, by D. L. Mathias, Metal & Thermit Corp.
Bi-axial Fatigue Strength of Low-Carbon Steels, by George K. Morikawa and LeVan Griffis, Illinois Institute of Technology.
Weldability Tests of Cast Steel, by C. E. Jackson and F. S. McKenna, Naval Research Lab.
Weldability—as-Rolled vs. Heat-Treated High Strength Constructional Steels, by Lt. S. A. Herres and W. L. Warner, Watertown Arsenal.

2:00 P.M.—Ships

Chairman—J. L. Wilson, American Bureau of Shipping.
Vice-Chairman—S. A. Midnight, American Shipbuilding Co.
Controls Required for Safe and Economical Construction of Welded Ships, by D. G. Maxson, Welding Consultant, Marinship Corp.
Technical Control of Welding in Ship Construction, by M. H. MacKusick, California Shipbuilding Corp.
Evolution of Welding in Shipbuilding, by M. N. Maltseff, Western Pipe and Steel Co.
Multiple and Stack Machine Cutting, by A. H. Yoch, Air Reduction Sales Co.

8:00 P.M.—University Research Conference

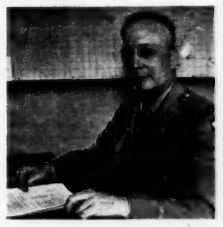
Wednesday, October 18

9:30 A.M.—Aircraft

Chairman—G. S. Mikhalapov, Nat'l Research Council.
Vice-Chairman—C. W. Dodge, Sciaky Bros.
Impact Strength of Arc Welded Joints in Aircraft Steel, by H. O. Klinke, Republic Aviation Corp.
Helium Shielded Arc Welding of Exhaust Collector Rings, by Francis H. Stevenson, Lockheed Aircraft Corp.
Multi-Arc Welding of Aluminum Alloys, by M. R. Rivenburgh and C. W. Steward, Curtiss-Wright Corp.

9:30 A.M.—Research

Chairman—Isaac Harter, the Babcock & Wilcox Co.
Vice-Chairman—E. R. Seabloom, Crane Co.
Intergranular Corrosion of Stainless Steel Welds, by Wm. T. Tiffin, University of Oklahoma.
The Effect of Time and Temperature on the Relief of Residual Stresses in Low Alloy Steels, by J. K. McDowell and Lt. Col. Paul C. Cunnick, Rock Island Arsenal.
Development and Application of Modern Heavy Coated Arc Welding Electrodes, by D. C. Smith and W. G. Rinehart, Harnischfeger Corp.



Colonel Ritchie
Ordnance Dept.

9:30 A. M.—Weldability Research Committee

The Tee-Bend Energy Weldability Test, by L. C. Bibber and J. Heuschkel, Carnegie-Illinois Steel Corp.

2:00 P.M.—Aircraft

Chairman—G. O. Hoglund, Aluminum Co. of America.
Vice-Chairman—E. S. Jenkins, Curtiss-Wright Research Laboratory.
The Geometry of a Spot Welding Tip and Its Relation to Tip Life, by E. D. Crawford and C. W. Steward, Curtiss-Wright Corp.
Survey of Chemical Cleaning Practices for Spot Welding Aluminum Alloys, by F. M. Morris, Kaiser Cargo, Inc., Fleetwings Div.
An Evaluation of Process Control of Aircraft Welding, by P. H. Merriman, The Glenn L. Martin Co.
Characteristics of Welding Arcs on Aluminum in Atmospheres of Helium and Argon, by F. A. Wassell, general Electric Co.

2:00 P.M.—Machinery

Chairman—A. E. Gibson, Wellman Engineering Co.
Vice-Chairman—R. J. Kriz, The James H. Herron Co.
Production Problems and Production Control, by E. C. Brekelbaum, Harnischfeger Corp.
Routine Inspection and Salvage of Machinery Weldments —Rough, Partially Machined and Machined, by James W. Owens, Fairbanks, Morse & Co.
Welded Jigs and Fixtures, by A. N. Kugler, Air Reduction Sales Co.
Design of Welded Machinery, by John Mikulak, Electric Machinery Manufacturing Co.

2:00 P.M.—Piping and Pressure Vessels

Chairman—A. C. Weigel, Combustion Engineering Co.
Vice-Chairman—R. W. Emerson, Pittsburgh Piping & Equipment Co.
Pressure Vessel Welding, by Edward B. McGuire, Hamler Boiler & Tank Co.
Normalizing of Welds in Carbon-Molybdenum Steel Pipe by 60-Cycle Induction Heating, by I. A. Rohrig and D. H. Corey, The Detroit Edison Co.
Properties of Welded Joints Between Dissimilar Metals, by E. C. Chapman and R. E. Lorentz, Combustion Engineering Co.
Oxy-Acetylene Pressure Welding, by A. R. Lytle, Union Carbide & Carbon Res. Labs.

6:30 P.M.—Section Officers Dinner and Conference

Thursday, October 19

9:30 A.M.—Foundry

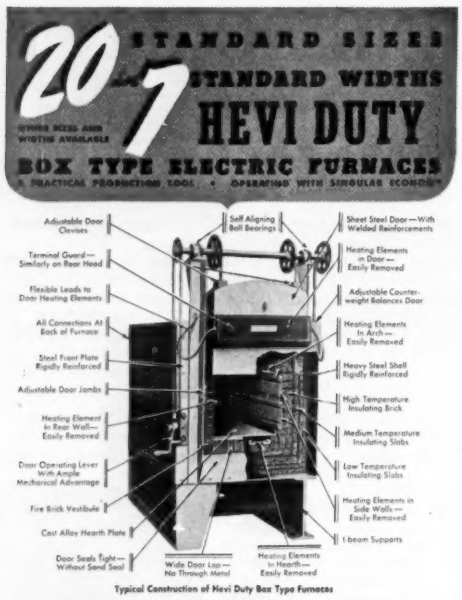
Chairman—L. A. Danse, Cadillac Motor Car Div.
Vice-Chairman—Austen J. Smith, Lunkenheimer Co.
Arc Welding Practices in the Steel Foundry, by Frank Kiper and Lawrence Gabes, Ohio Steel Foundry.
Machine Cutting of Risers, Flame Scarfing to Remove Padding, and Flame Gouging to Remove Webs and Defects, by G. E. Bellew, Air Reduction Sales Co.
Repair of Castings, by L. A. Danse, Chairman, G. M. Metallurgical Committee, General Motors Corp.

9:30 A.M.—Miscellaneous

Chairman—W. E. Crawford, A. O. Smith Corp.
Vice-Chairman—A. L. Pfeil, Universal Power Corp.
Low Temperature Joining, by R. D. Wasserman and C. E. Swift, Eutectic Welding Alloys Co.
How Much Ductility Is Necessary for a Structure or Machine?, by W. J. Conley, Lincoln Electric Co.

2:00 P.M.—Business Meeting

3:00 P.M.—Board of Directors Meeting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Wide Door Lap—No Through Metal
Heating Elements In Hearth—Easily Removed
Sheet Steel Door—With Welded Reinforcements
Heating Elements in Door—Easily Removed
Adjustable Counterweight Balances Door
Heating Elements In Arch—Easily Removed
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Metal Literature Review—*Continued*

16. FURNACES AND FUELS (*Cont.*)

16-104. Basic Principles of Combustion Engineering of Hot-Dip Galvanizing Furnaces. Wallace G. Imhoff. *Industrial Gas*, v. 23, August '44, pp. 21-22, 40-44.

A discussion of galvanizing furnace parts, and requirements; the brickwork, steelwork, shell, bracing, combustion chambers, flues, and stack.

16-105. Granite City Steel Company Increases Production Facilities. Charles Longenecker and Ralph Vaill. *Blast Furnace and Steel Plant*, v. 32, August '44, pp. 919-926.

To increase the ingot capacity of the plant, three 175-ton open-hearth furnaces were erected. Other improvements throughout the plant include the erection of a chemical and metallurgical laboratory of modern design and equipment, the addition of a fourth steam generator, extensions to several buildings, including the general office.

16-106. The Heating of Open-Health Furnaces with Mixed Coke-Oven and Blast Furnace Gas. R. W. Evans. *Blast Furnace and Steel Plant*, v. 32, August '44, pp. 932-935.

Effect of luminosity on slag foams; effect of foaming slags on refining; luminosity in mixed-gas flames. 7 ref.

16-107. Inflating Blast Furnace Gas Mains with Coke Oven Gas. Leonard Tofft. *Blast Furnace and Steel Plant*, v. 32, August '44, pp. 936-937.

Use of coke oven gas to keep the mains inflated during a shutdown has proved successful; it has been found that only a nominal amount of coke oven gas, about 235 cu. ft. per min., is required to maintain 15 in. of pressure in the system.

16-108. A Coreless Induction Furnace in the Cast Steel Industry. Fritz Harms. *Stahl und Eisen*, v. 64, no. 11, March 16, '44, pp. 175-178.

Description of an installation consisting of two 2.5-ton and one 0.5-ton furnaces; average output of the installation, melting time, and the conditions of slagging; the advantages of the coreless induction furnace; cost of the installation; current consumption; cost of production. Tensile properties of 20 plain carbon (0.16 to 0.45%) and of 25 alloy steels (1 Mn, 1½ Cr, ¼ Mo, 0.08 V; 1 Cr, 0.10 V; 1½ Mn, 0.15 V; 2¼ Cr, ¼ Mo, 0.10 V; 1¼ Mn, 0.10 V) made in the induction furnaces tabulated.

16-109. Voltage Transients in Arc-Furnace Circuits. *Electrical Engineering*, v. 63, August '44, pp. 563-568.

Transient voltages in arc-furnace circuits; installation and test data.

16-110. Electronic Regulator for Arc Furnaces. J. E. Reilly and C. E. Valentine. *Electrical Engineering*, v. 63, August '44, pp. 601-603.

Electronic regulator which controls electrode position as determined by response to current in the electrode and voltage between the electrode and the furnace shell. Features and performance of an installation for a furnace having hydraulic control.

16-111. Physical and Mechanical Aspects of Combustion. *Industrial Heating*, v. 11, August '44, pp. 1288, 1290.

Combustion characteristics; combustion in the open-hearth; characteristics of a combustion system.

16-112. A New Principle in Gas-Fired Furnaces. *Machinery* (London), v. 64, June 22, '44, p. 678.

Construction; advantages.

16-113. Recent Advancements in Industrial Heating Processes and Equipment. II. *Industrial Heating*, v. 11, August '44, pp. 1258, 1260, 1262, 1264, 1266, 1268.

High temperature salt baths; patterned burner application; billet heating furnaces; developments in separately prepared furnace atmospheres; electric salt bath furnaces; new basis needed for rating furnace production.

17. REFRACTORIES AND FURNACE MATERIALS

17-37. Getting the Most Out of Electric Steel Furnace Electrodes. R. L. Baldwin. *Metals & Alloys*, v. 20, July '44, pp. 62-67.

Handling methods, joint-assembly techniques, electrical conditions, operating practices.

17-38. Basic Refractories for the Copper Industry. III. R. P. Heuer and A. E. Fitzgerald. *Metals & Alloys*, v. 20, July '44, pp. 68-72.

Refining furnaces — General construction; bottom construction; providing for expansion; basic roofs for intermittent operation.

17-39. Carbon Refractories Meet Severe Temperature Conditions. *Brick and Clay Record*, v. 105, August '44, pp. 40-42.

Material is easily molded into any size or shape unit, can be further fabricated on the construction job; special properties for special uses of these refractories.

17-40. Application of Metallic Recuperators. John H. Loux. *Steel*, v. 115, August 21, '44, pp. 118-120.

Reducing temperature of flue gases to 1700° F. by diluting them with air from two points practically eliminates all maintenance of recuperators and assures satisfactory life of elements; greater turbulence is secured by the addition of more cast needles; data covering skelp, bath and rotary-hearth furnaces.

17-41. Developments in Insulating Materials. T. F. Wall. *Engineering*, v. 157, June 23, '44, pp. 482-483.

Study of properties to ascertain how they may best be manufactured.

17-42. Determining the Quality of Silica Brick. Frank G. Norris. *Industrial Heating*, v. 11, August '44, pp. 1316, 1318.

A report of typical results being derived from a scientific study of refractory problems.

17-43. Foundry Applications of High-Temperature Heat Insulation. *Industrial Heating*, v. 11, August '44, pp. 1328-1329.

Insulating refractory materials, including firebrick.

17-44. Arc Furnace Refractories. Norman F. Dufty. *West Scotland Iron & Steel Institute Journal*, v. 51, 1943-44, no. 3, pp. 35-42.

Best bricks to use for various parts of the furnace, considering costs and availability.

17-45. Insulation of Steel Plant Equipment. J. H. Chesters. *Iron Age*, v. 154, August 24, '44, pp. 42-49.

Insulation of the steel plant from the point of view of its optimum use and available materials, their characteristics and special applications.

17-46. Permeable Refractories in Furnace Construction. *Engineering*, v. 157, June 23, '44, p. 499.

A new principle in gas-fired furnace design, involving the use of permeable insulating refractories through which the furnace gases are withdrawn from the combustion chamber.

17-47. Open-Hearth Refractory and Masonry Problems Discussed at Conference. II. *Industrial Heating*, v. 11, August '44, pp. 1320, 1322, 1324, 1326.

Present service life of refractories compared with that of former periods of less sustained operation, and new developments in the field of refractories for open hearth use.

18. HEAT TREATMENT

18-163. Principles of Heat Treating of Steels. T. F. O'Brien. *Steel Processing*, v. 30, July '44, pp. 436-439.

Liquid heating media, pyrometry and quenching and quenching media.

18-164. Heat Treating Hollow Steel Propeller Blades. *Steel Processing*, v. 30, July '44, pp. 445-447.

Furnaces for heat treating propellers and propeller hubs. The pit type furnace for drawing and normalizing propeller blades. A special atmosphere circular pit type furnace with rotating covers for hardening.

18-165. Springs of Case-Hardened Mild Steel. A. M. Borzdika. *Stal*, No. 1-2, pp. 42-44. *Iron Age*, v. 154, July 27, '44, pp. 49-51.

Experiments on substituting carburized mild steel for spring steel wire and strip. The method consists of deep penetration carburization at low temperatures. The use of fish scales proved to be a soft carburizing agent of great power of penetration.

18-166. Induction Heating of Propeller Blade Hubs. *Iron Age*, v. 154, July 27, '44, p. 53.

Induction heating arrangement to heat the hubs of propeller blades forged by Chevrolet has increased production measurably through improvement in handling conditions, decreased heat in the working area and more uniform temperature in the metal worked.

18-167. Nitriding Hardened High Speed Steel Tools. J. G. Morrison. *Mechanical Engineering*, v. 66, August '44, pp. 539-542.

Liquid nitriding of hardened high speed steel tools appears to have its greatest field of usefulness when applied to those tools which take relatively light cuts, and where impact and other mechanical disadvantages are moderate. 6 ref.

18-168. The Nitriding Process; Factors Influencing Ammonia Consumption. C. V. Snell. *Metal Progress*, v. 46, August '44, pp. 299-304.

Normal operation at 970° F. consumes 20 to 30 cu. ft. of ammonia gas per hr. for every 100 sq. ft. of surface being nitrided. Operating temperature, analysis of steel, and surface smoothness, all influence consumption. A two-stage process to reduce the gas consumption and eliminate the "white layer." A new method for measuring case depth described.

18-169. Incomplete Quenches. *Metal Progress*, v. 46, August, '44, pp. 308-312, 314.

Timed quenching, by Muir L. Frey. Martempering, by Benjamin F. Shepherd. Hot quenching and austempering, by H. J. Elmendorf.

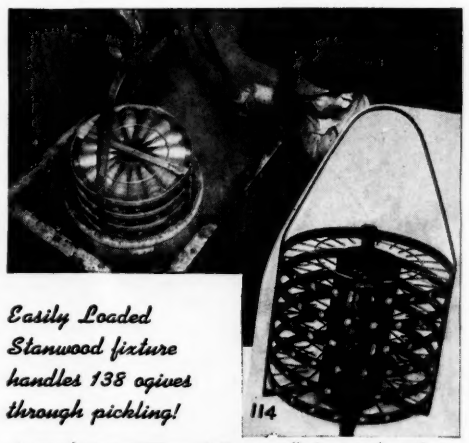
18-170. Liquid Carburizing of Transmission Gears. W. A. Silliman. *Metals & Alloys*, v. 20, July '44, pp. 58-61.

Parts treated in electric salt bath furnaces not only solved the distortion problem but also resulted in increased production and other benefits.

18-171. Importance of Design and Mass in Water Quenching Steel Castings. W. J. Phillips. *The Foundry*, v. 72, August '44, pp. 89, 201, 202, 204.

Influence of the size and shape of steel castings on practice followed in water quenching.

(Continued on Page 14)



Easily Loaded Stanwood fixture handles 138 ogives through pickling!

A manufacturer of 75mm shell parts called on us for a fixture to handle shell noses through the pickling processes. Requisites were easy loading, minimum contact with surface of parts to be processed, ruggedness and resistance to corrosion.

The Monel fixture shown was the solution. Stanwood has the ideas, the engineers and the production facilities to solve your fabricated container problem—baskets, fixtures, trays, carburizing boxes, retorts, etc. Send for Bulletin 14.

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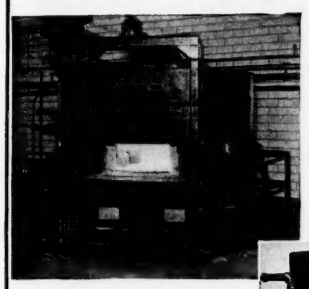
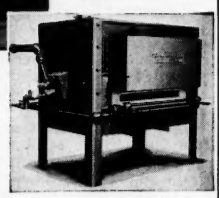
MAHR Firing Method



PROVIDES AUTOMATIC Combustion Control!

(LEFT) MAHR Center Fired Rotary Hearth Furnace

(BELOW) A modern MAHR Slot Type Stationary Forging Furnace. Fires toward and with arch from both sides.



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Ask for Bulletin No. 1000 on MAHR *center fired* Rotary Hearth Furnaces, or Bulletin No. 210 about other MAHR Forging Furnaces.

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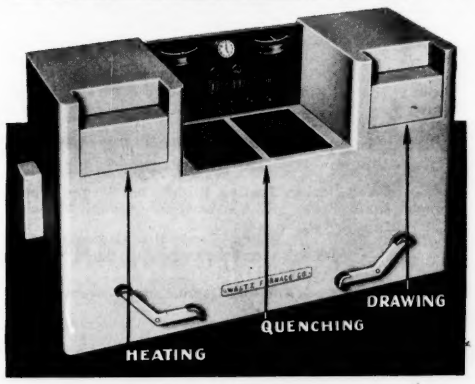

A Complete Heat Treating Department

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Heating Range 1400 deg. to 2350 deg. F.

Quenching—Oil and Water

Drawing Range 250 deg. to 1100 deg. F.

2 Sizes—

10″ wide x 8″ high x 15″ deep

12″ wide x 10″ high x 18″ deep

Actual working space.

USED IN

Toolrooms, Tool & Die Shops, Production Shops, Experimental and Control Laboratories, Commercial Heat Treating Shops, for small parts and odd jobs.

USED FOR

Heat treating all types of oil and water hardening steels, annealing, normalizing, pack hardening, stress relieving, nitriding (with special equipment).

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STRESS ANALYSIS PROGRAM

Fall Meeting, Society for Experimental Stress Analysis, Cleveland, Oct. 17-20, 1944

W. M. Murray of Massachusetts Institute of Technology (Right) is President of the Society for Experimental Stress Analysis. Above, left to right, are R. D. Mindlin, Columbia University; C. Lipson, Chrysler Corp.; and M. Hetenyi, Westinghouse Electric & Mfg. Co., members of the Executive Committee.

Two Group Meetings Will Discuss New Specification Methods

No, it was not luck that prompted A.S.M.'s program committee a year ago to schedule a group meeting on "Purchase of Steels on Performance Rather Than Analysis", a topic that drew a capacity audience to the grand ballroom of the Palmer House at last year's convention in Chicago. It was a knowledge that a large group of A.S.M. members in both the steel industry and large consuming industries were working on ideas that would embody their mutual belief that chemical specifications — so well known as the S.A.E. analyses — were handicapping the production of alloy steels without delivering to the customers material of the desired uniformity.

A. L. Boegehold

In the intervening 12 months these studies have progressed to a point where definite recommendations can be made. Two group meetings to consider the whole problem have been scheduled for this year's convention in Cleveland.

Hardenability Bands to Be Explained

The first will be held on Tuesday afternoon at 2:00 p.m. and is on "Hardenability Bands as a Basis for Purchase and Use of Steel", wherein the steel manufacturer's ideas will be expressed by John Mitchell, metallurgical engineer on alloy steels for Carnegie - Illinois Steel Corp. (and who has been more responsible than any other man for the development of the National Emergency steels) — and the consumer's attitude will be debated by A. L. Boegehold, head of the metallurgical division of General Motors Research Laboratories.

John Mitchell

The National Emergency steels feel the fullest impact of "tramp" alloying elements, and the new ideas on steel specifications take care of unexpectedly large variations in chemistry by accepting them *provided* their hardenability falls within fairly narrow limits, specified for each type and grade. The second group meeting on this general problem will therefore be titled "National Emergency Steels and Hardenability Specifications From the Consumer's Standpoint" (Tuesday evening, Oct. 17, 8:30 p.m.), and the panel will consist of a half dozen men from large industries.

Tuesday, October 17

10:00 A.M.—Grand Ballroom, Hotel Carter

Words of Welcome by President W. M. Murray

Technical Session

Chairman—C. O. Dohrenwend, Armour Research Foundation.

Shot Peening to Improve Fatigue Resistance, by O. J. Horger and H. R. Neifert, The Timken Roller Bearing Co.

Plastic-Flow Problems by Photo-Grid Methods, by J. F. Harding and C. P. O'Haven, Armour Research Foundation.

Load Distribution in Riveted and Spot-Welded Joints, by M. Göland and L. D. Morris, Curtiss-Wright Corp.

2:30 P.M.—Grand Ballroom, Hotel Carter

Technical Session

Chairman—O. J. Horger, The Timken Roller Bearing Co.

Residual Stress Studies of Life Improving Surface Treatments, by R. W. Greaves, E. C. Kirstowsky and C. Lipson, Chrysler Corp.

New Approaches to Engineering Design, by E. E. Stilson, R. H. Peterson and R. C. Pocock, Bendix Aviation Corp.

Wednesday, October 18

10:00 A.M.—Grand Ballroom, Hotel Carter

Symposium on Crankshaft Stresses

Chairman—C. Lipson, Chrysler Corp.

Structural Evolution of a Crankshaft, by S. Oldberg and C. Lipson, Chrysler Corp.

Determination of Operating Loads and Stresses in Crankshafts, by A. Goloff, Caterpillar Tractor Co.

Metallurgical Processing of Packard Built Rolls-Royce Crankshafts, by M. L. Frey, Packard Motor Car Co.

2:30 P.M.—Grand Ballroom, Hotel Carter

Technical Session

Chairman—J. M. Lessells, Massachusetts Institute of Technology.

Full Scale Fatigue Testing of Crankshafts, by C. W. Gadd and N. A. Ochiltree, General Motors Research Laboratories.

Determining Crankshaft Durability for Increased Performance of In-Line Engine, by W. Osborn, Sterling Engine Co.

Thursday, October 19

10:00 A.M.—Grand Ballroom, Hotel Carter

Technical Session

Chairman—C. W. MacGregor, Massachusetts Institute of Technology.

The Application of Stress Models to Specific Structural Problems, by S. F. Tingley, Goodyear Aircraft Corp.

Electrical Analogy for Shear Lag Problems, by R. E. Newton, Curtiss-Wright Corp.

Electric Method for the Solution of Laplace's Equation, by V. Paschkis, Columbia University.

6:30 P.M.—Grand Ballroom, Hotel Carter

S.E.S.A. Dinner

Friday, October 20

10:00 A.M.—Grand Ballroom, Hotel Carter

Technical Session

Chairman—E. L. Shaw, Goodyear Aircraft Corp.

Precision Determination of Weight by Means of Bonded Strain Gages, by A. L. Thurston, Cox & Stevens Aircraft Corp., and R. W. Cushman, The Foxboro Co.

The Magnetic Coupled-Torque Meter, by B. F. Langer, Westinghouse Research Laboratories.

Impact Stress Analysis by Brittle Coatings, by G. Ellis, Magnaflux Corp.

2:30 P.M.—Grand Ballroom, Hotel Carter

Special Session on Electrical Strain Gage Techniques

Chairman—G. S. Burr, Forging Research Association.

Electric Gaging Systems: Their Selection and Application, by H. C. Robert, University of Illinois.

Open Forum for Discussion on Characteristics of Amplifiers, Characteristics of Galvanometers, Calibration Circuits, Methods of Recording, Use of Crystals in Stress. Analysis, and Additional Topics Put Forward by the Audience.

Bliss & Laughlin Opens New Sales Office

Bliss & Laughlin, Inc. has opened a new sales office in Hartford, Conn. It will be under the direction of Walter A. Fairchild.

A.S.M. Review of Current Metal Literature—*Continued*

18. HEAT TREATMENT (*cont.*)

18-172. What Quenching Oil to Use. W. G. Forbes. *Iron Age*, v. 154, August 3, '44, pp. 50-51, 136.
The author's preference for mineral oils for all types of quenching.

18-173. What New Heat Treatments of Steel Presage in Design. Harry W. McQuaid. *Machine Design*, v. 16, August '44, pp. 107-112.
Effects of induction heating on design; combating decarburized surfaces; design benefits of improved quenching; new trends in heat treating.

18-174. Straight-Line Processing of Armor Plate. *Iron Age*, v. 154, August 10, '44, p. 62.
Hardening, quenching, degreasing and tempering armor plate by means of the Drever process, with Brown electronic air-controlled instruments with air operated valves reduced production costs as much as 50% in the manufacture of ⅛-in. and ¾-in. plate.

18-175. Wartime Developments in Heat Treatment of Steel and Their Effect on Design. Harry W. McQuaid. *Steel*, v. 115, August 21, '44, pp. 123, 164-165.
Induction hardening; isothermal heat treatments; controlled atmosphere heating; improved quenching.

18-176. Vincent Steel Process Co., Plants Offer Broad Commercial Heat Treating Facilities. *Industrial Heating*, v. 11, August '44, pp. 1334-1336, 1338, 1340, 1342.
Brief description of plants' equipment.

18-177. Practical Aspects of Induction Heating. Wesley M. Roberds. *Iron Age*, v. 154, August 24, '44, pp. 50-55.
The relation of frequency and power to depths of hardened layers and self-quenching. Design principles of applicator coils are discussed in connection with control over current densities.

18-178. Martempering of NE and Older Alloy Steels. *Industrial Heating*, v. 11, August '44, pp. 1254, 1256.
Equipment, procedures and results.

19. WORKING
Rolling, Drawing, Pressing, Forging

19-216. Sheet-Metal Shortcuts. G. Eldridge Stedman. *Steel*, v. 115, July 31, '44, pp. 72-74, 76, 78.
Aircraft manufacturer's ingenious use of new forming methods and equipment.

19-217. Draw-Press Work. Eugene D. Viers. *Steel*, v. 115, July 31, '44, pp. 85-86, 115-116.
Correct lubrication proves key to successful operation.

19-218. Forging Die Design. John Mueller. *Steel Processing*, v. 30, July '44, pp. 425-426, 439.
Die design for forging ring and hub shapes.

19-219. Stamping to Close Tolerances and the Use of Coining. *Steel Processing*, v. 30, July '44, pp. 427-429, 435.
The close tolerances possible in stampings and the contribution of coining and sizing to the production of stampings of exact dimensions.

19-220. Cold Roll Forming. C. M. Yoder. *Iron & Steel Engineer*, v. 21, July '44, pp. 64-72.
Cold forming in continuous mills offers considerable economy over hot rolling methods for the production of many shapes.

19-221. Continuous Drawing, Cutting-Off and Straightening Machine. James Farmer. *Engineering*, v. 158, July 7, '44, pp. 7-8.
Wire is fed in from a coil and delivered as straight rods of predetermined length.

19-222. Hot Forming of Magnesium Alloy Sheets. E. P. Resos. *Iron Age*, v. 154, July 27, '44, pp. 43-48.
Weight saving factors are spur to explore the possibilities of magnesium alloys in aircraft structures. A summary of experimental investigations recently carried out at Vultee Field of basic interest to production and designing engineers.

19-223. Impact Extrusion of Aluminum. *Light Metal Age*, v. 2, July '44, pp. 9-11.
The impact extrusion process is particularly well adapted for the production of straight-sided, round and rectangular shells having a high ratio of length to cross-sectional area. The process permits the addition of necks and bosses at the closed end as an integral part of the extruded side wall.

19-224. Modern Wire Drawing Practice. *Metals & Alloys*, v. 20, July '44, pp. 73-77.
A pictorial trip through a new mill.

19-225. Automatic Roll Forming. G. W. Birdsall. *Steel*, v. 115, August 7, '44, pp. 86-90, 150, 152, 154.
Cuts production costs, speeds fabrication of fan and generator drive pulleys for jeeps, half-tracs, trucks, and other equipment. Ingenious use of roll forming with composite stampings; formed bar stock, malleable castings, etc. produces greatly diversified line of V-type pulleys. Assembly methods include riveting, projection and spot welding, silver brazing in electric induction units, copper brazing in controlled-atmosphere chainbelt furnaces.

19-226. Precision Coining on the Punch Press. *Tool Engineer*, v. 14, August '44, pp. 71-72.
Stamping industry developed techniques for cold-coining vital parts to close tolerances.

19-227. Pneumatic Accumulator Aids Shell Forging. C. H. Vivian. *Compressed Air Magazine*, v. 49, August '44, pp. 198-203.
System maintains constant water pressure at the forging presses and descaler. The accumulators store energy that can be drawn upon as needed.

19-228. Tube Mills for Russia. *Steel*, v. 115, August 14, '44, pp. 104, 160.
Convert coils of unpickled hot rolled steel strip into finished products of desired length, by continuous "straight-line" action.

19-229. Sub-Sieve Diamond Powders for Die Work. Paul L. Herz. *Wire & Wire Products*, v. 19, August '44, pp. 479-484, 516.
Producing accurately graded powders.

19-230. Electric Equipment for Wire Drawing Machines. A. L. Thurman. *Wire & Wire Products*, v. 19, August '44, pp. 488-492.
Tensiometers on wire drawing; applications; build-up reels; electric reel drives.

19-231. The Manufacture of Specialty Diameter Wire. *Wire & Wire Products*, v. 19, August '44, pp. 505-507.
Step-wire.

19-232. Limits of Formability for Sheet Magnesium Parts. P. A. Nagy. *Product Engineering*, v. 15, August '44, pp. 529-533.
Forming qualities of four magnesium alloys by the Guerin process and recommendations for the design of formed sheet magnesium parts are presented. Results of an investigation are summarized for flanges, joggles, beads and lightening holes. Tabular data include recommended bend radii, shearing stresses for holes and cupping depths for flanged holes. Relations between high forming temperatures and physical properties, and between sheet thickness and bend radii are shown graphically.

19-233. The Design of Stampings for Quantity Production. R. A. W. *Machinery* (London), v. 65, July 20, '44, pp. 65-71.
Tolerances and clearances, finishes applied to stampings, and drawings and specifications for stampings.

19-234. Chevrolet-Detroit Forge Plant Served by Gigantic Power Plant. *Industrial Heating*, v. 11, August '44, pp. 1236, 1238, 1240.
Production capacity.

20. MACHINING AND MACHINE TOOLS

20-272. Drill Fixture for Structural Angles. *Iron Age*, v. 154, July 27, '44, p. 51.
Drill fixture for locating holes in structural angles up to 10 ft. in length. T-bar holding assembly equipped with scales and indicators for quick and accurate indexing in both coordinate directions.

20-273. Redesigning to Improve Speed and Accuracy. E. D. Beachler. *Machine Design*, v. 16, August '44, pp. 133-138.
Crankpin turning-lathe achieves high production and precise operation with highly automatic controls and novel design features.

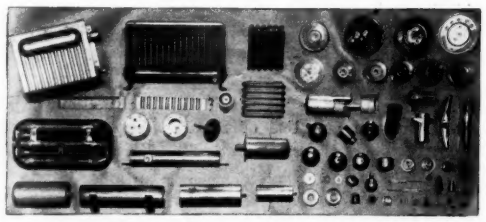
20-274. Effect of Structure and Composition on the Machinability of Copper Alloys. D. K. Crampton. *Metal Progress*, v. 46, August '44, pp. 275-284.
How machinability is related to nature of dispersed phase, the composition of the alloy in major constituents, the previous cold work (the temper draw), and the nature of the cutting operation.

20-275. Yale & Towne Sets Up Ingenious Machining Department for Locks. *Die Casting*, v. 2, August '44, pp. 44-46, 50-53.
A seven-station Kingsbury machine set up for substantially complete machining of a padlock body.

20-276. Tools, Jigs and Fixtures at North American Aviation. Gerald Eldridge Stedman. *Machine Tool Blue Book*, v. 40, August '44, pp. 129-130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152.
N.A.A. original designs in machine tools, jigs, and fixtures.

20-277. Fundamentals in Milling Practice. H. A. Frommelt. *Machine Tool Blue Book*, v. 40, August '44, pp. 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 184, 186.
Good work piece setups, proper choice and assembly of cutters and correct operation of the machine.

20-278. Electronic Drilling Control. P. D. Aird. *Machin Tool Blue Book*, v. 40, August '44, pp. 199-200, 202, 204, 206.
Utilization of the increase in the torque load in the drill spindle as activating agent in automatically withdrawing drill point from the work.



A few parts being joined in EF brazing furnaces. Products ranging from small metal radio tubes up to large automotive and refrigerator units are joined neatly, securely and economically by this process.

For Joining Metal Parts, Neatly Securely, Economically and Continuously

"Greatly improved results—neater, stronger joints—60 to 75% faster, at about one quarter the former labor cost," that briefly is the report received from a prominent midwestern plant after installing an EF continuous brazing furnace.

Within a month after installing their first furnace, a second similar but larger furnace was ordered for other products—both furnaces are now operating side by side, joining all kinds of assemblies—large and small—neatly, economically and securely.

Products difficult or expensive to make in one piece can be made in several pieces and joined—thus not only reducing the cost but actually improving the quality and appearance. Products requiring several stampings joined or requiring screw machine parts, forgings and stampings to complete the unit, can be neatly and economically joined right in your production line.

Any number of pieces can be joined at one time. The most intricate parts or assemblies are made to actually "grow together," and joints made which are as strong, or even stronger than the original parts.

Investigate This Process for Joining YOUR Aluminum, Brass, Copper or Steel Parts

Send for printed matter, showing various types of EF furnaces.

The Electric Furnace Co., Salem, Ohio

Gas Fired, Oil Fired and Electric Furnaces for Any Process, Product or Production

Mention R454 When Writing or Using Reader Service.

20-279. Low Cost Tools Without Elaborate Drawings. W. J. Curry. *Machine Tool Blue Book*, v. 40, August '44, pp. 252, 254, 256.
Adequate tools can be obtained in shorter time at much lower cost by assigning the jobs to ingenious mechanics who will design, develop, and test the tools without drawings, and frequently with very little machining. Illustrations show low cost tools designed and built by Michael Reichlin, at General Electric's Lynn River Works.

20-280. Mattison Precision Vertical-Spindle Way Grinder. *Machine Tool Blue Book*, v. 40, August '44, p. 294.
A new type grinder for finishing tables, slides, saddles, heads, turrets and other parts, having angular machined ways or surfaces.

20-281. Machining Tool Steels at High Speeds. A. W. West. *Tool Engineer*, v. 14, August '44, pp. 67-70.
Manufacture of gripper dies for hot forging is speeded by high speed milling with carbides. Radius grinding fixture produces negative rake cutters to mill grooves.

20-282. Product Re-Design Introduces New Methods. *Tool Engineer*, v. 14, August '44, pp. 74-80.
Mass manufacture of D. C. motor of same size as A. C. unit of comparable power, imposed problems in machining parts to higher accuracy and assembling them in smaller space.

20-283. Oil Field Shops Demand Top Tooling. Gerald E. Stedman. *Tool Engineer*, v. 14, August '44, pp. 81-83.
Producing machines and tools which lowered drilling costs.

20-284. Manufacturing Small Parts to High Accuracy. John E. Hyler. *Tool Engineer*, v. 14, August '44, pp. 86-90.
Swiss-type automatics, built in America, produce tiny parts 0.015 to ½ in O.D. Intricate contours, recesses and undercuts can be machined in a single operation. Form tools are not usually required.

20-285. Machining Magnesium. A. M. Lennie. *Tool Engineer*, v. 14, August '44, pp. 91-94.
Recommended methods for ten machining operations.

20-286. Heavy Surface Grinding for Precision. *Tool Engineer*, v. 14, August '44, p. 99.
Heavy-duty machines eliminate hand-scraping and save as much as 75% of production time.

20-287. Production of Chaser Blocks for the Namco Diehead. *Machinery* (London), v. 65, July 6, '44, pp. 1-6.
List of the operations in the production of the chaser block.

20-288. Care and Use of Thread-Cutting Dies. M. B. H. *Machinery* (London), v. 65, July 6, '44, pp. 9-12.
Recommended practice in the maintenance and application of thread-cutting dies having tangential type chasers.

20-289. Use of "Cushions" Adds to the Life of Tipped Tools. Leo J. St. Clair. *American Machinist*, v. 88, August 3, '44, pp. 83-85.
Thin copper "cushion" between the tool shank and tip has been credited with increasing tool life as much as five times and permits use of high-cobalt tips.

20-290. Combination Tooling Eliminates Second Operation on Small Parts. A. Ainsworth. *American Machinist*, v. 88, August 3, '44, pp. 86-88.
Results and advantages gained through combination tooling on automatic screw machines. Each example is a different design principle.

20-291. Cast Chuck Centers Bevel Gear. *American Machinist*, v. 88, August 3, '44, p. 89.
Aircraft gear held by the teeth in a quickly made Kirksite chuck while grinding operations are done on shank.

20-292. Machining Tolerances Held in Producing Small Stamped Parts. *American Machinist*, v. 88, August 3, '44, pp. 90-93.
Fine finishes and tolerances to 0.0005 in. are being attained on war products where stampings are used to replace forgings and castings formerly required.

20-293. Subtractive Lead Method Used to Hob Gears with Small Helix Angles. J. W. Bergman. *American Machinist*, v. 88, August 3, '44, pp. 97-98.
Helix angles, small as 0.001 in. per inch of face width, can be formed by using lead and non-differential gearing combinations.

20-294. Economical Tapping Results from Use of Chute and Indexing Fixtures. Herman Goldberg. *American Machinist*, v. 88, August 3, '44, pp. 102-104.
Precision tapping at a rate of 2000 to 3800 pieces an hr. Examples and variations of both shown.

20-295. Practical Ideas. *American Machinist*, v. 88, August 3, '44, pp. 105-110.
Air-operated table for hand miller. Gage indicates faults of tapers. Modernizing dial indicator stands. Gage life extended by adding dial indicator. Lathe attachment for turning spherical surfaces. Special toolblock reduces cutting time. Improvised winding machines. Drawing lines parallel to a splined line. Boring and tapping fixture for engine lathe. Two simple carbide tools replace form tool. Simple arrangement removes chips from taps.

20-296. Jump-Turning Operations Increase Production of 155-mm. Howitzers. Sanford Wixson. *American Machinist*, v. 88, August 3, '44, pp. 111-115.
Segmental threads an unusual job; inspected on the machine; left-hand nut for safety; shaper operation shortened.

20-297. Standard Equipment Adapted to Produce Recoil Mechanisms. G. Walter Ostrand. *American Machinist*, v. 88, August 3, '44, pp. 116-120.
In conversion to armament production, Link-Belt developed set-ups that eliminated need for new and special machines, saving time and expense.

20-298. Working to "Tenths" on the Sperry Aircraft Gyropilot. George A. Richroath. *Machinery*, v. 50, August, '44, pp. 152-161.
Exacting methods of machining, assembly, and inspection are employed by Sperry in building the Gyropilots used in combat planes. Fine instrument making on a large-scale production basis.

20-299. Grinding Fluids Deserve Careful Study. W. H. Oldacre. *Machinery*, v. 50, August '44, pp. 185-186.
Review of grinding fluids; chip formation in grinding.

(Continued on Page 16)

RADIUM & X-RAY PROGRAM

M. B. Evans, Pres.

P. B. Johnson, Sec.

J. A. Catanzano Treasurer

American Industrial Radium and X-Ray Society, Hollenden Hotel

Thursday, Oct. 19

10:00 A. M.—Technical Session

Automatic Film Processing and Equipment, by Robert Sarderson.
X-Ray and Welding Control, by John. J. Chyle.
A Practical Comparison of Fluoroscopy with Radiography, by Robert Mayer.
Filtration, by Don M. McCutcheon.

2 P. M.—Annual Meeting
Mehl Lecture

Election of Officers.
Address by Retiring President, Maynard B. Evans, Jr.
Experimental Stress Analysis in Radiographically Sound Materials, by George L. Clark, University of Illinois.

Friday, October 20

10:00 A. M.—Technical Session

Quality Control of Radiographs by a Direct Density Check, by Alvin F. Cota.
A Simplified Method of Film Evaluation, by Emery Meschter.
Method of Determining Metal Thickness Radiographically, by H. P. Moyer and P. L. Kline.
Three Dimensional Radiography, by Douglas Wineck.

2:00 P. M.—Technical Session

Requirements in Specifications for Uniform Radiographic Technique, by George A. Russ.
The Use of Static Tests as a Method of Determining the Radiographic Classification of Castings, by F. S. Wyle.
An Example of Electron Images in Million Volt Radiography, by Al Morris.
The Three Functions of the Radiographic Interpreter, by Leslie W. Ball.

CLEVELAND SECTION

American Industrial Radium and X-Ray Society

Monday Evening, October 16

Hotel Hollenden

Use of Microradiography in Identifying Defects in Castings, by L. W. Ball, Triplett & Barton Corp.

Cleveland Offers Advantages For Metal Industry Plants

Cleveland and Northeast Ohio's many superior advantages as a place for metal industries to locate and prosper have been compiled in a new 16-page booklet. "The Best Location in the Nation," published by the Industrial Development Division of The Cleveland Electric Illuminating Co.

The booklet covers such important phases as available plants and plant sites, transportation facilities, manpower, raw material, parts, supplies, banking facilities and many other services important to the metal industries.

The company's Industrial Development Division offers complete survey material covering specific problems of any organization considering expansion, or new factories, after victory.

"Whatever metal products you may make, you will find Cleveland and Northeast Ohio capable of supplying most of your requirements in iron, steel, aluminum, copper, brass, or manganese," the booklet states.

"Not only are these vital requirements right at hand, but here are numerous other things used in manufacturing, such as lumber, rubber, chemicals, plastics, paints, varnishes, lacquers, enamels and porcelain." The booklet points out that only in Northeast Ohio can industry find such a complete supply of assets.

Copies of "The Best Location in the Nation", or more specific information on how Cleveland and Northeast Ohio fit into your postwar picture can be obtained by writing to the Industrial Development Division, Cleveland Electric Illuminating Co., 75 Public Square, Cleveland 1, Ohio.

ABOVE—Milling machine vise, with inserts of Kennametal at points "A" and "B".

UPPER LEFT—Galled surfaces of steel jaw and screw.

LOWER LEFT—Kennametal inserts minimize wear.

The superiority of Kennametal for wear-resistant purposes is graphicly demonstrated in this milling machine vise. The steel parts of the jaw and screw (enclosed in box "A") wore and tore under the twisting force exerted by the clamping mechanism. Thin discs of Kennametal—one brazed to the end of the screw, another recessed into the jaw at the abutting point—permit the jaw to be closed securely, and opened readily, with less effort. The performance of the vise has been further improved by inserts of Kennametal in the sliding surfaces on which the work rests, at points marked "B".

The high hardness of Kennametal (78 Rockwell C), and its unique non-galling property, provide resistance to abrasive wear that is up to 100 times that of steel. Kennametal's modulus of elasticity—2 to 3 times that of steel—minimizes possibility of deformation. Its unusual dimensional stability makes creep negligible.

Kennametal is available in a variety of standard shapes, or it can be furnished molded into almost any special form, limited only by reasonable proportions. We have supplied Kennametal . . . as accurately molded inserts for the customer to apply and grind as desired . . . mounted on parts furnished to us, and then finished by the customer or by us . . . embodied in elements or devices produced complete in our plant.

You can readily, and economically, incorporate Kennametal in the wear-areas of the machines you use, and the products you manufacture. Tell us your problem. We will suggest how Kennametal can solve it.

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CHAPTER MEETING CALENDAR

CHAPTER	DATE	PLACE	SPEAKER	SUBJECT
Baltimore	Oct.	Engineers Club	J. Rutherford	Statistical Methods in Inspection
Boston	Oct. 6		John Lee	Aviation Night
Buffalo	Oct.		H. J. Babcock	Isothermal Heat Treating
Calumet	Oct. 10	Phil Schmidt's	B. W. Gonser	Recent Non-Ferrous Advances
Chicago	Oct. 12	Chicago Bar Assoc.	E. D. Martin	Advances in Manufacture of Tinplate
Cincinnati	Oct. 12	Cincinnati Engineering Society	A. W. Winston	Magnesium Alloys
Cleveland	Oct. 2	Tudor Arms Hotel	H. B. Osborn	Induction Heating
Columbus	Oct. 24	Ft. Hayes Hotel	A. Allan Bates	Plastics Vs. Metals
Dayton	Oct. 11	Engineers Club	Dr. Del Rosa	High Frequency and Flame Hardening
Detroit	Oct. 9	Rackham Bldg.	H. W. McQuaid	(William P. Woodside Lecture)
Ft. Wayne	Oct. 24	Chamber of Commerce		Steel Rolling
Georgia	Oct. 2	The Duchess, Atlanta	Harold S. Sizer	Milling and Grinding
Indianapolis	Oct. 23	Y. W. C. A.	A. A. Bates	Industrialization of South America
Lehigh Valley	Oct. 6	Hotel Bethlehem, Bethlehem, Pa.	L. C. Grimshaw	Tool and Die Steels
Los Angeles	Sept. 28	Sculley's	B. Berlien	Practical Heat Treating
Los Angeles	Oct. 26	Sculley's	W. S. Nash	Hardenability
New Jersey	Oct. 16	Essex House	Hans Ernst	High Speed Milling
Northwest Pennsylvania	Sept. 28	Titusville, Pa.	C. T. Evans, Jr	High Temperature Alloys for Dynamic Loading
Notre Dame	Oct. 11	Univ. of Notre Dame	Charles Hardy	Powder Metallurgy
Ontario	Oct. 6	Toronto	H. M. Webber	Silver and Copper Brazing
Philadelphia	Sept. 29	Engineers Club	N. L. Mochel	Some Wartime Developments and Their Possible Place in the Post-War Period
Philadelphia	Oct. 27	Engineers Club	N. I. Stotz	High Speed Steel—Trends in Types and Treatments
Pittsburgh	Oct. 12	Roosevelt Hotel	L. L. Ferrall	Principles and Problems in the Development of Hardenability Bands
Pueblo Group	Oct. 19		Ordnance Dept. Representative	War Materials
Rhode Island	Oct. 4			Plant Visitation to Walsh Kaiser Shipyard, Providence
Rockford	Oct. 25	Faust Hotel	W. E. Thomas	Magnetic Inspection
Rocky Mtn.	Oct. 20	Oxford Hotel, Denver	Ordnance Dept. Representative	War Materials
Saginaw Valley	Oct. 10	Frankenmuth, Mich.	H. T. Colwell	Post-War Status of Materials
Tri-City	Oct. 12	Ft. Armstrong Hotel, Rock Island, Ill.	John Mitchell	Development and Possibility of Hardenability Bands
Warren	Oct. 12	Warren Odd Fellows	Edgar C. Bain	Functions of Alloying Elements in Steel
Washington	Oct. 9	Statler Hotel	C. A. Zapffe	Gases in Metals
West Michigan	Oct. 9	Grand Rapids	A. P. Seasholtz	Salt Bath Heat Treatment

CALENDAR OF OTHER MEETINGS

Sept. 25-27—Association of Iron and Steel Engineers. Annual Engineering Conference, Pittsburgh. (Brent Wiley, Empire Bldg., Pittsburgh.)

Sept. 28-30—National Tool and Die Manufacturers Association. Annual Meeting, Hotel Statler, Buffalo, N. Y. (M. W. Rowell, General Manager, Southern Bldg., 15th and H Sts., Washington, D. C.)

Oct. 2-5—American Society of Mechanical Engineers. Fall Meeting, Netherland-Plaza Hotel, Cincinnati, Ohio. (Clarence E. Davies, Secretary, 29 West 39th St., New York 18, N. Y.)

Oct. 5-6—American Institute of Mining and Metallurgical Engineers. Electric Furnace Steel Conference, Pittsburgh, Pa. (F. T. Sisco, 29 West 39th St., New York 18, N. Y.)

Oct. 5-7—Society of Automotive Engineers. Aircraft Engineering and Production Meeting, Hotel Biltmore, Los Angeles, Calif. (John A. C. Warner, Secretary and General Manager, 29 West 39th St., New York 18, N. Y.)

Oct. 5-7—National Electronics Conference. Medinah Club, Chicago. (Beverly Dudley, Secretary, 520 N. Michigan Ave., Chicago, Ill.)

Oct. 10-11—Gray Iron Founders' Society. Fall Meeting, Cincinnati, Ohio. (W. W. Rose, Executive Vice-President, 1341 Connecticut Ave., N. W., Washington, D. C.)

Oct. 12-14—American Society of Tool Engineers. Semi-Annual Meeting, Syracuse, N. Y. (Adrian L. Potter, Executive Secretary, 2567 W. Grand Blvd., Detroit 8, Mich.)

Oct. 13-14—Electrochemical Society. Fall meeting, Hotel Statler, Buffalo, N. Y. (Colin G. Fink, Columbia University, New York City.)

Oct. 16-20—National Metal Congress and War Conference Display. Public Auditorium, Cleveland, Ohio. (W. H. Eisenman, 7301 Euclid Ave., Cleveland 3, Ohio.)

Oct. 16-20—American Society for Metals. 26th Annual Meeting, Hotel Statler and Hotel Hollenden, Cleveland, Ohio. (W. H. Eisenman, Secretary, 7301 Euclid Ave., Cleveland 3, Ohio.)

Oct. 16-18—American Institute of Mining and Metallurgical Engineers. Fall Meetings of Iron and Steel Division and Institute of Metals Division, Hotel Statler, Cleveland, Ohio. (F. T. Sisco, 29 West 39th St., New York 18, N. Y.)

Oct. 16-19—American Welding Society. Annual Meeting, Hotel Cleveland, Cleveland, Ohio. (Miss M. M. Kelly, Secretary, 33 West 39th Street, New York 18, N. Y.)

Oct. 16-19—Wire Association. Annual Meeting, Pittsburgh, Pa. (R. E. Brown, Secretary, 300 Main St., Stamford, Conn.)

Oct. 17-20—Society for Experimental Stress Analysis. Semi-Annual Meeting, Hotel Carter, Cleveland, Ohio. (Prof. W. M. Murray, Massachusetts Institute of Technology, Cambridge, Mass.)

Oct. 19-20—American Industrial Radium and X-Ray Society. Annual Meeting, Hotel Hollenden, Cleveland, Ohio. (Philip D. Johnson, Secretary, 25 East Washington St., Chicago 2, Ill.)

Oct. 30-Nov. 1—American Gear Manufacturers Association. 27th Semi-Annual Meeting, Edgewater Beach Hotel, Chicago. (Newbold C. Goin, Executive Secretary, Empire Bldg., Pittsburgh 22, Pa.

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Metal Literature Review—*Continued*

20. MACHINING (*cont.*)

20-300. **Design of Tools and Fixtures.** *Machinery*, v. 50, August '44, pp. 187-189.
Die for cutting matching notches in two side frames simultaneously; contour follower gage for inspecting irregular profiles; facing attachment designed with automatic feed; high-speed milling results.

20-301. **Air-Operated "Razors" for Rivet Heads.** *Compressed Air Magazine*, v. 49, August '44, p. 212.
Portable air-driven milling tool that supplements the pneumatic riveting hammer.

20-302. **Cutting-Tool Performance.** Axel E. Lundbye. *Mechanical Engineering*, v. 66, August '44, pp. 536-538, 542.
Increasing tool life and life of machine parts by combination of chromium plating and after-treatment by Lundbye process.

20-303. **Gun Barrels Machined from Reduced Forgings.** Frank J. Oliver. *Iron Age*, v. 154, August 10, '44, pp. 46-49.
By demanding forgings finished more closely to size, Springfield Armory has saved a tremendous amount of material in manufacturing barrels for the M-1 cal. 0.30 Garand rifle. Revision of the initial machining operations has resulted in use of 22 less machine tools and correspondingly fewer operators.

20-304. **Sensational Increase in Milling Speed.** J. H. Grayson. *Steel*, v. 115, August 14, '44, pp. 92-93, 142.
Attained with standard machine equipped with carbide cutters—provided utmost rigidity is engineered into the setup and a "momentum wheel" is used.

20-305. **Production of the Allison Liquid-Cooled Aeroengine.** *Machinery* (London), v. 65, July 20, '44, pp. 57-62.
Automatic machines developed to eliminate hand-lapping previously necessary on cylinder-head assemblies and cylinder-head covers.

20-306. **Punching on the Centre Line of Strip of Varying Width.** *Machinery* (London), v. 65, July 20, '44, p. 63.
Stock guides with automatic adjustment.

20-307. **Milling Cutters and How to Use Them.** M. Martellotti. *American Machinist*, v. 88, August 17, '44, pp. 91-95.
Use of cutter materials governed by known characteristics.

20-308. **Users Agree on Proposed Machine Tool Improvements.** *American Machinist*, v. 88, August 17, '44, pp. 99-100.
Questions and answers by H. T. Johnson of General Motors.

20-309. **Three-Dimensional Surface Plate Cuts Labor Costs 40 Percent.** Earl M. Barden. *American Machinist*, v. 88, August 17, '44, pp. 102-104.
The universal setting fixture helps in positioning locators accurately and economically on large aircraft pipe fixtures replacing the costlier methods requiring a level or transit.

20-310. **Index Reaming Fixture for Precision Work.** Henry Bernadt. *American Machinist*, v. 88, August 17, '44, p. 105.
A triangular positioning piece which rotates in a vertical plane on a pivot attached at right angles to a base and standard. Indexing is accomplished by an arm which rotates about the same axis as the positioning piece.

20-311. **Good Tooling for Difficult Screw Machine Jobs.** *American Machinist*, v. 88, August 17, '44, pp. 106-107.
Parts produced with little or no scrap by attention to tooling, gaging and handling.

20-312. **How One Machine Tool Builder Produces Direct War Goods.** C. K. Swafford. *American Machinist*, v. 88, August 17, '44, pp. 108-111.
New production processes and special set-ups for turning out various parts for Naval materiel under subcontracts.

20-313. **Practical Ideas.** *American Machinist*, v. 88, August 17, '44, pp. 115-120.
Machining a ball bearing fit in blind holes. Automatic power cut-off to prevent tool breakage. Block method for measuring tapers. Automatic feed and ejector for power punch. Improved trammel points. Lathe jack for large shafts. Safety device for lathe leadscrews. Rack for grinding wheels. Lifting and rolling device for a plate bending press. Worn-out chaser dies converted into finished tools.

20-314. **Tool Room Surface Grinding.** J. E. Corbett. *Tool and Die Journal*, v. 10, August '44, pp. 89-92.
Purpose of this article was to establish rule: The warmed side of a piece of stock (originally flat, parallel and of uniform temperature) will become convex and cause the piece to bow. If, in this condition, the warm side is then ground flat, it will become depressed or concave as the temperature throughout the piece again becomes uniform.

20-315. **Modern Designs for Drilling Jigs and Tapping Fixtures.** *Tool and Die Journal*, v. 10, August '44, pp. 98-102.
High speed precision tapping, rear sight assemblies, base and bolt handle base for rifles, high speed horizontal tapping machine, vertical tapping machine.

20-316. **Hole Piercing Proves Faster—and Cheaper.** Herbert Chase. *Aviation*, v. 43, August '44, pp. 161-162.
Major economies are achieved by avoiding the slow process of drilling, separate dimpling, and hand rivet insertion operations; even piercing of holes in extrusions saves time.

20-317. **Master Tooling Dock Facilitates Assembly Fixture Building. II.** Thomas A. Dickinson. *Aero Digest*, v. 46, August 1, '44, pp. 80-82, 130.
Line vs. multi-line production; programming assembly tooling; developing the mockup.

20-318. **Some Aspects of Precision Grinding Practice.** R. Whibley. *Machinery* (London), v. 64, June 22, '44, pp. 679-685.
Some developments that increase the three modern requirements of accurate sizing, rate of output and finish.

20-319. **Determining Position Adjustments in Centreless Grinding.** P. Grodzinski. *Machinery* (London), v. 64, June 22, '44, pp. 686-689.
Correct truing of the wheel and the adjustment of the guide rail.

20-320. **A Critical Survey of Surface-Finish Parameters.** H. Peter Jost. *Machinery* (London), v. 64, June 22, '44, pp. 690-691.
The relative value of some of the most important of the commonly-used geometrical parameters that are based on the profile curve.

20-321. **Machine Tools and Production Equipment.** *Machinery* (London), v. 64, June 22, '44, pp. 692-695.
The unisaw; automatic sizing attachment for Monarch lathes; Bryant No. 112 internal grinder; safety stop for planer tables.

20-322. **15-in. Centre Tool-Testing Lathe.** *Engineering*, v. 157, June 23, '44, p. 486.
Lathe has a central height of 15 in. and admits work 11 ft. long between centers. The tool can be tried out on sufficiently large material to provide extended runs.

21. CLEANING AND FINISHING

21-89. **Cleaning Aircraft Parts.** *Iron Age*, v. 154, July 27, '44, pp. 54, 55.
Procedures used in sand blasting, degreasing and alkaline cleaning. Economical plant installations and the limitations of each cleaning and precleaning method.

21-90. **Superfinishing.** W. E. R. Clay. *Machinery* (London), v. 65, July 6, '44, pp. 13-16.
Characteristics, wear reduction, load-carrying capacity increased, surface-measuring equipment.

21-91. **Stainless Steel and Magnesium Pickling.** *Iron Age*, v. 154, August 3, '44, pp. 59, 138.
Special pickling problems arising from the individual characteristics of stainless steel and magnesium. Operational sequences and unit installations described.

21-92. **Reclamation of Electrical Insulating Varnish.** D. L. Gibson and C. H. Braithwaite. *Iron Age*, v. 154, August 3, '44, pp. 68-69.
A portable type pressure filter is used periodically to restore the used shop varnish to a state equal to that of new varnish.

21-93. **The Coloration of Stainless Steels.** Clements Batcheller. *Metal Finishing*, v. 42, August '44, pp. 466-469, 474.
First commercially developed process for the surface treatment of the simple and complex groups of ferrous alloys.

21-94. **Annotated Bibliography of Aluminum Cleaning.** Jay C. Harris and Robert B. Mears. *Metal Finishing*, v. 42, August '44, pp. 475-479, 495.
Brings bibliography up to date. Includes abstracts of Federal specifications relating to metal cleaning.

21-95. **Finishing Soldiers' Helmets.** Frank V. Faulhaber. *Metal Finishing*, v. 42, August '44, pp. 511-514.
Pickling points; temperature uniformity; uniform consistency; care and conservation; painting procedure; maintaining equipment; infra-red drying; no pre-heating; less fire hazard.

21-96. **Baking Shell Cases with Infra-Red.** *Metal Finishing*, v. 42, August '44, pp. 516-517.
Process can be used with overhead or flat conveyors for either dip or spray finishing.

21-97. **Methods and Standards for Gloss Measurement of Camouflage Materials.** Richard S. Hunter. *Metal Finishing*, v. 42, August '44, pp. 519-522.
The sources of discrepancy in gloss measurements and the recommendations made for obtaining satisfactory agreement. 10 ref.

21-98. **Fundamentals of Cleaning Die Castings.** R. W. Mitchell. *Die Casting*, v. 2, August '44, pp. 74-80.
Reasons for, and a general outline of methods. Cleaning before buffing, deburring, burnishing, plating, painting, lacquering.

21-99. **Cleaning Aircraft Parts.** Temple Davis. *Welding Engineer*, v. 29, August '44, pp. 38-40.
The results of Douglas Aircraft's experiments and production experience in preparing aluminum alloy sheets for welding.

21-100. **The Composition of Buffing Compounds.** Henry R. Power. *Products Finishing*, v. 8, August '44, pp. 38, 40, 42.
Action; ingredients; cleaning.

21-101. **Increasing Efficiency in Metal Finishing. II.** Jeffrey R. Stewart. *Products Finishing*, v. 8, August '44, pp. 66, 68, 70.
Primers for aircraft; comparison of primers for steel; adhesion of protective coatings; heat proof coatings; corrosion resistant tests.

21-102. **Magnesium.** G. C. Close. *Industrial Finishing*, v. 20, August '44, pp. 38, 42, 44, 49-50, 55.
Cleaning, surface treating and protective coating of magnesium.

21-103. **Accelerated Sulphuric Acid Anodizing.** G. V. Akimoff, N. D. Tomashoff and M. N. Tukina. *Light Metals*, v. 7, July '44, pp. 311-319.
Advantages of the sulphuric-acid process summarized. Investigations to determine the possibility of further improvements. 5 ref.

22. WELDING, BRAZING AND FLAME CUTTING

22-349. **Precambering Technique in Welding Fabrication of Hatch Covers.** Gerald Eldridge Stedman. *Steel Processing*, v. 30, July '44, pp. 421-424.
Hatch covers, production line, welding, precambering, channel and final positioner jigs, gear reduction drive on final positioner, assembly jig.

22-350. **Recent Progress in the Application of Welding to Steel.** Wendell F. Hess. *Steel Processing*, v. 30, July '44, pp. 430-431, 435.
Design of structure from the standpoint of rigidity and thickness of material. Methods of solving specific problems with various welding processes.

(Continued on Page 18)

A Portion of the Underground Exhibit Hall in Cleveland's Public Auditorium.

Two Papers on Fractography Explain New Research Tool

A new tool of metallurgical research known as "fractography" is the subject of an important paper to be featured by the American Society for Metals on Friday morning, Oct. 20, during the National Metal Congress. The authors are Carl A. Zapffe and Mason Clogg, Jr. of Rustless Iron and Steel Corp.

Fractography is the name applied by the authors to the technique of studying untouched cleavage facets at high magnification.

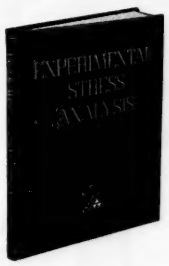
As a supplementary metallurgical tool, fractography by definition offers many of the advantages of single-crystal methods, since the field is oriented about the cleavage plane; the field is nascent and untouched and therefore reveals much of the internal structure of the grain which cannot be seen after polishing and etching; the plane of weakness, which is often the plane of greatest interest, becomes ipso facto the field of observation; time may be saved by avoiding mounting, polishing, and etching; and tiny chips and otherwise unusable fragments are suitable for fractographic examination.

As a research tool, fractography has especially interesting aspects, for cleavage facets abound in detail, most of which remains to be explored. Examples are shown for numerous metallic and non-metallic specimens, and observations are included on appearance of grains and grain boundaries, determination of constitution by fractography, new structures, and new facts about known structures.

A second paper on "Cleavage Structures of Iron-Silicon Alloys" applies this metallographic technique to the iron-silicon binary system. The cleavage patterns, or fractographs, of these alloys, besides being useful as supplementary metallographic information, resist explanation on classical grounds of deformation and cleavage and clearly point to the pre-existence of an intracrystalline imperfection structure which must exert a tremendous influence upon the entire nature of the material.

Vol. II No. I READY OCTOBER 1, 1944

EXPERIMENTAL STRESS ANALYSIS



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Hardenability Bar Quenched From Both Ends Described

A hardenability test bar selectively quenched from both ends is described by Charles R. Wilks, Earnshaw Cook and Howard S. Avery of American Brake Shoe Co. in a paper on "Further Developments of the End-Quench Hardenability Test". The paper will be given before the American Society for Metals technical session on Monday morning, Oct. 16.

This test bar has been developed to provide correlations with the thermal histories of quenched plates that correspond more closely than is possible with the standard single end quench specimen.

For those steels where the pearlitic reaction may be avoided but which transform partially or wholly under the same cooling conditions to acicular structures of the Bainite type, this test should be useful in predicting behavior at the section center, since the mechanical properties at the center of symmetrical double end quench specimens may be determined.

Experimental cooling curves are reported and a chart of specimen dimensions versus the thickness of plates quenched in agitated water is included.

Seccombe Heads Kelley-Koett Sales Organization

William C. Seccombe, long associated with George William Finnegan who represented the Kelley-Koett Mfg. Co., Covington, Ky., now heads the George William Finnegan, Inc., sales and service organization which will continue as Kelley-Koett representatives.

Powder Metallurgy Program Will Concentrate on Products

Metal powders, powder metallurgy, and parts made from metal powders have occupied the attention of group meetings at each National Metal Congress since this type of "round table discussion" was pioneered by the A.S.M. Interest in this intriguing subject continues to mount. Consequently it is only natural that another discussion will be held in Cleveland on Wednesday, Oct. 18, at 4:00 o'clock—this time devoted exclusively to *products* from metal powders.

Up to now many of the interesting but highly technical processes of powder production, die design and press operation have been held as trade secrets by the originators. This is understandable, but is a reason why nearly all published articles and professional discussions have been couched in generalized terms.

This year, however, in concentrating on *products* from metal powders, an A.S.M. program is promised wherein the auditors can get some down-to-the-ground information that will help each one appraise the desirability of such materials as parts in his own assemblies, and their advantages and disadvantages in comparison with metallic parts made by more conventional methods, or, possibly more important, the chances that either may be better than plastics parts.

Priestley and LeVan Head Union Carbide Subsidiaries

Union Carbide and Carbon Corp. has announced two successors to the late Francis P. Gormely to head various units of the corporation. William J. Priestley has been elected president of Electro Metallurgical Co., Electro Metallurgical Co. of Canada, Ltd., Michigan Northern Power Co., and Union Carbide Co. of Canada, Ltd. E. E. LeVan is the newly elected president of Haynes Stellite Co.

E. E. LeVan *W. J. Priestley*

Mr. LeVan has been with Haynes Stellite since 1922, successively as chief engineer, general sales manager and vice-president and general manager. Mr. Priestley joined Electro Met in 1923 as consulting metallurgist, becoming vice-president in charge of sales development in 1932.

Shaw Scott Retires as I. of M. Secretary

The Institute of Metals, London, has announced the retirement of G. Shaw Scott from the secretaryship of the Institute, which he has held for the past 36 years. Mr. Shaw Scott will be succeeded by K. Headlam-Morley, who is also secretary of the Iron and Steel Institute.

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A.S.M. Review of Current Metal Literature — *Continued*

22-351. **Surface Conditioning for Spotwelding Aluminum.** Thomas E. Piper. *Light Metal Age*, v. 2, July '44, pp. 12-13.
A new proven technique, which combines preparatory cleaning and etching into one operation, and which has removed over fifty per cent of the spot welding trouble at Northrop Aircraft Co. It has permitted extremely long runs without requiring tip cleaning, and has opened the door to production spot welding.

22-352. **Welding and Cutting Adapted to Line Production.** Forrest Waldo. *Iron Age*, v. 154, August 3, '44, pp. 52-58.
A monorail conveyor is used to carry the beams from one work station to the next, and as much as possible the performance of each operation is so planned as to minimize or eliminate the possibility of workers getting ahead of schedule or the building up of surplus stocks at any stage of fabrication.

22-353. **Welded Diesel Manifold.** B. E. Vankrimpen. *Welding Engineer*, v. 29, August '44, pp. 27-29.
A highly complicated assembly successfully held to 1/16 in. tolerance in a 10-ft. length by precision welding. Helixhaust manifold.

22-354. **Beveling Tube Intersections.** T. B. Jefferson. *Welding Engineer*, v. 29, August '44, pp. 30-31.
Northern Ordnance Inc. designed a special flame-cutting machine that cuts a true cylindrical intersection and leaves a beveled edge in the tubing.

22-355. **"Nervous Weld" Process.** Clyde B. Clason. *Welding Engineer*, v. 29, August '44, pp. 32-33.
A new type of welding developed to plug blowholes or otherwise add metal to salvage castings—particularly aluminum.

22-356. **Building with Steel Tubing.** *Welding Engineer*, v. 29, August '44, pp. 34-36.
Lower costs and lesser weight are two of the reasons for today's trend towards the use of welded tubing for structural purposes.

22-357. **Stress-Relief Welding.** Glenn F. Crosiar. *Welding Engineer*, v. 29, August '44, p. 37.
Longitudinal stresses in welded ship plates can be greatly reduced by a method providing outlets for the escape of stresses.

22-358. **Skip Welding Thin Stainless.** Joseph S. Wright. *Welding Engineer*, v. 29, August '44, p. 41.
Preventing buckling and warping of 1/16-in. thick stainless steel sheets used in the fabrication of a cowl 12 ft. in diameter.

22-359. **Welded Ship Okayed.** *Welding Engineer*, v. 29, August '44, pp. 42-44.
Investigation of the design and methods of constructing welded steel merchant vessels. Poor loading and ballasting, heavy seas and low temperatures were found to contribute materially to structural distress.

22-360. **Silver Brazing of Tools and Gages.** Frederic L. Woodcock. *Metals & Alloys*, v. 20, July '44, pp. 78-82.
Used for repair and rehabilitation of broken and worn tools, dies and gages and for the construction of new tipped tools. Applications of both types and details of operating technique. 4 ref.

22-361. **Nervous Welding.** L. E. Kunkler. *Steel*, v. 115, August 7, '44, pp. 92, 94.
The process employes a low voltage, high amperage welder in combination with compressed air and a vibrator and is especially adapted for use in plugging holes and cracks in steel, gray iron, malleable and Al bronze castings. The process also may be used for adding metal to internal and external diameters for press fit applications.

22-362. **Selective Copper Brazing in Salt Bath Furnaces.** *Iron Age*, v. 154, August 10, '44, p. 51.
Process employs electric salt bath furnaces which permits the selective heating of the parts to be brazed, eliminates decarburization, and has reduced scrap from 15% to a maximum of 3% as compared with conventional methods.

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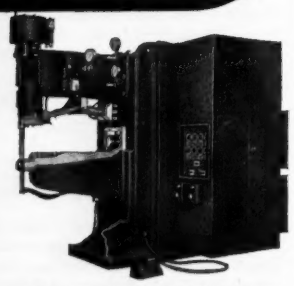

Above: Type PMCO.5S-2, 240 KW Press type welder. Capacity: Aluminum and other light alloys up to two thicknesses of .187". Special sequence for steels up to .375".

Left: Type PMCR.0-1, 30 KVA Air operated rocker arm welder. Capacity: clean mild steel from two thicknesses of .016" up to and including .080".

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22-363. **Copper Brazing as a Production Tool.** C. L. Hibert. *Automotive & Aviation Industries*, v. 91, August 1, '44, pp. 32-35, 67-68, 70, 74, 76, 78.
Technique, material, applications and physical strength of copper brazed joints.

22-364. **Forming and Welding Curtiss Hollow Steel Propeller Blades.** Holbrook L. Horton. *Machinery*, v. 50, August '44, pp. 170-180.
Press working and welding hollow steel propeller blades described.

22-365. **Joining Aluminum Alloys.** E. C. Hatmann, G. O. Hoglund, and H. A. Miller. *Steel*, v. 115, August 14, '44, pp. 102, 148, 150, 152, 154, 156.
Gas welding works well in joining sections from 0.025 to 1 in. thick.

22-366. **Exhaust Manifolds for Flying Forts.** *Industry & Welding*, v. 17, August '44, pp. 40-43.
Automotive methods speed production. Welding increased wear ring production and reduced production time of collector ring tail by 23 min.

22-367. **Redesign of Hoist Equipment.** *Industry & Welding*, v. 17, August '44, pp. 44-47.
Post-war welding outlook.

22-368. **Well Begun . . . More Than Half-Done.** R. G. Hawley. *Industry & Welding*, v. 17, August '44, pp. 48-49, 94-97.
The various steps taken in setting up for the gun mount job.

22-369. **Oxy - Acetylene Pipe Line Systems - I.** D. F. Guthrie and R. W. Stewart. *Industry & Welding*, v. 17, August '44, pp. 56-60.
Reasons for, and methods of establishing pipe line systems in large plants.

22-370. **Keeping Boilers in Action.** *Industry & Welding*, v. 17, August '44, pp. 66-67.
Development of stud welding makes it applicable in the boiler plant.

22-371. **Structural Failures in Welded Ship Construction (Tentative).** Report of Subcommittee on Hull Construction, Committee on Welding in Marine Construction, American Welding Society, 1944, 9 pp.
Principal factors causing failure; definitions of residual stresses, reaction stresses, stress concentrations; means to reduce residual stresses; general precautions relative to reaction stresses; plate fractures in cold weather; metallurgical considerations; engineering control.

22-372. **Weldability Standards for Alternate Aircraft Steels (Tentative).** Prepared by Aircraft Welding Standards Committee, American Welding Society, 1944, 14 pp.
Tee-bend test; transverse butt-joint tension tests of ¼-in. plate, 18-in. sheet, and 1-in. tubing; welded double-tube triangle test. Use to compare proposed alternate steels with standard aircraft steels.

22-373. **Resistance Welding in Aircraft.** O. A. Perry and H. D. Hager. *Iron Age*, v. 154, August 17, '44, pp. 66-71.
Speeded production by developing multiple spot-welders for the tack assembly of stainless steel ammunition boxes and chutes, and an index spot-welder for landing flap deflectors. Collet type dies have been developed for the concentric alignment of tubing for flash welding.

22-374. **Electrodes for Welding Aluminum Bronze.** *Engineering*, v. 158, July 21, '44, p. 48.
Electrode for welding aluminum bronze introduced under the trade name Murex "Bronalex". This electrode deposits metal containing approximately 10% aluminum, 4% iron, and 4% nickel. The tensile strength of the weld metal is of the order of 37 to 41 tons per sq. in. and the crystal size of the weld is much finer than that existing in castings.

22-375. **Bogie Bracket Support Assemblies.** W. Tindall. *Welding*, v. 12, July '44, pp. 310-314.
Fabrication of components for British tanks.

22-376. **The Welding Manipulator.** I. R. Waller. *Welding*, v. 12, July '44, pp. 322-326.
Uses and advantages of modern handling equipment.

22-377. **Arc Welding of Magnesium Aircraft Structures.** V. H. Pavlecka and John K. Northrop. *Welding*, v. 12, July '44, pp. 327-332.
Newly developed method of arc welding magnesium aircraft structures using the "Heliarc" process.

22-378. **The Spot Welding of Light Alloys.** R. F. Tylecote. *Welding*, v. 12, July '44, pp. 344-349.
Refrigeration, strength properties, tension and tearing, fatigue, structural properties and stress distribution, cold working, corrosion, metallurgy, macrostructure, microstructure, the design of joints and the spacing of welds. 6 ref.

22-379. **All-Welded Tank Cars.** Albin Anderson. *Railway Mechanical Engineer*, v. 118, August '44, pp. 353, 361.
Cars differ in design and construction from standard tank cars. In Olsson cars practically the whole structure is welded. No separate underframe, merely at each end, a fixed, two-wheel frame welded to the tank and consisting of bearing forks, buffer beam, draw box and cross members. These end parts carry the buffers, draw gear, spring suspension, and brake devices.

22-380. **Flame Filled Future.** Daniel Minturn. *Scientific American*, v. 171, Sept. '44, pp. 103-105.
Oxy-acetylene flames, once thought to have extremely limited uses, are branching out as versatile tools in the metal-working industry.

22-381. **Spot Welding Heavy Steel Sections.** Fred A. Lee. *Steel*, v. 115, August 21, '44, pp. 98-101, 144, 146, 148, 150, 152.
Departures from conventional practice make joining of alloy steel plate a fairly simple procedure in fabrication of Army half-tracs.

22-382. **Joining Aluminum Alloys.** E. C. Hartmann, G. O. Hoglund and M. A. Miller. *Steel*, v. 115, August 21, '44, pp. 110, 113, 116, 156, 158, 160, 162.
Variations in arc-welding procedure, including metal arc, carbon arc, carbon torch, tungsten arc, atomic hydrogen, automatic and semi-automatic carbon arc.

22-383. **Repair and Maintenance of Tools by Welding.** *Canadian Metals and Metal Industries*, v. 7, August '44, pp. 32-35, 52.
Silver brazing applications; applying carbide tips; silver brazing procedure; brazing temperature is critical; atomic hydrogen applications reclaiming high-speed drills; lathe tools repaired; welding high-speed broaches.

22-384. **New Process Bonds Aluminum Cooling Fins to Steel Cylinder Barrels.** *Industrial Heating*, v. 11, August '44, pp. 1270, 1272.
The Al-Fin makes possible marked reduction in the structural weight of an aircooled engine and greatly improves the cooling efficiency of its cylinders.

22-385. **Welding and Production.** J. Henderson. *Engineering*, v. 157, June 23, '44, pp. 497-499.
A general picture of some of the methods available, their applications and limitations, and the necessity for the closest co-operation between the designer, the welding engineer and the production engineer.

23. INDUSTRIAL USES AND APPLICATIONS

23-224. **Self-Contained Power Trains.** C. M. Laffoon. *Steel*, v. 115, July 31, '44, pp. 80, 82, 114.
Broad requirements for metallic materials and components made from them are represented in new emergency electric plants.

23-225. **Lattice Girder Construction.** C. S. Sheperd. *Iron & Steel Engineer*, v. 21, July '44, pp. 52-53.
Crane bridges using single web lattice construction for both main and auxiliary girders.

23-226. **Wright Aero Produces Engines for the B-29 Superfortresses.** K. E. Sutton. *Machinery*, v. 50, August 44, pp. 134-143.
2200-horsepower engines built by modern manufacturing methods.

23-227. **Die Castings for Airacobras Ring the Bell.** *Die Casting*, v. 2, August '44, pp. 25-27, 56.
Thousands of man-hours and considerable machining equipment saved.

23-228. **Style and Efficiency in Heat Control Devices.** *Die Casting*, v. 2, August '44, pp. 28-29.
Die castings used for efficiency of manufacture and stylizing possibilities.

23-229. **Aluminum Die Casting Alloys for Marine Applications.** *Die Casting*, v. 2, August '44, pp. 40-43, 61-62.
Aluminum alloys discussed in regard to physical properties and characteristics as a guide to the selection of the proper alloy for specific applications. Navy Specification 46A14 (INT).

23-230. **Non-Ferrous Alloy Blanking Dies.** *Iron Age*, v. 154, August 3, '44, pp. 46-49, 132, 134.
British practice in the use of non-ferrous alloys for aircraft dies traced from the early use of high strength die casting alloys to the development of K.M. alloy. Tool and die design as well as template production discussed.

23-231. **Making Zinc Alloy Aircraft Forming Dies.** Gerald E. Stedman. *Metals & Alloys*, v. 20, July '44, pp. 83-88.
Practical details of the techniques and methods employed to make zinc alloy blanking and forming dies at a large midwestern aircraft plant.

23-232. **NE Steels in Oil Well Drilling Equipment.** Blaine B. Westcott. *Metal Progress*, v. 46, August '44, pp. 291-294.
NE 8700 steels satisfactorily substituted for S.A.E. 3100 and 4100 steels formerly used for tool joints and drill collars, and for S.A.E. 4800 steels formerly used for rock bits. No acceptable substitute has been found to give the corrosion resistance of 1.5% Ni steels, required for sucker rods.

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A.S.M. Review of Current Metal Literature — *Continued*

23-233. How United States Designers Shift to Use of NE Steels. O. L. Mesenhimer. *Steel*, v. 115, August 7, '44, pp. 98, 101, 160.
Highly stressed parts such as diesel engine studs employ substitute steels in program closely keyed to Navy requirements and to production problems.

23-234. Carbon-Brush Contact Films: II. C. Van Brunt. *General Electric Review*, v. 47, August, '44, pp. 28-35.
Striking effect of oxygen on cuprous oxide contact films. Adjuvants, or substitutes, for film carbon lubrication at high altitudes. What experiments with brass collectors have taught.

23-235. Use of Alloy Steels Foreseen for Railroad Equipment. S. L. Hoyt and H. W. Gillett. *Iron Age*, v. 154, August 10, '44, pp. 52-55.
Metallurgical factors involved in the use of liquid quenched steels in place of the low carbon steels traditionally used for rolling stock construction. The part that welding can play in reducing weight.

23-236. Non-Ferrous Alloy Blanking Dies. *Iron Age*, v. 154, August 10, '44, pp. 58-62.
British zinc alloy die practice. Description of tool and die design and the procedures followed in the full scale layout system for the accurate reproduction of light metal parts.

23-237. Low Tin Babbitted Bearings. T. E. Eagan. *Iron Age*, v. 154, August 10, '44, pp. 64-66.
Techniques developed in bonding processes, such as the Kolene process for cast iron backings, and the use of a highly satisfactory lead-arsenic bearing metal are given prominence.

23-238. Locomotive Axleboxes. E. S. Cox. *Engineering*, v. 158, July 21, '44, pp. 58-60.
Design, manufacture, operation and maintenance of bearings.

23-239. Non-Ferrous Alloy Blanking Dies. *Iron Age*, v. 154, August 17, '44, pp. 74-80.
Manufacture of zinc alloy dies. Trial runs on blanking steel up to 18 SWG indicate a die life of about 500.

23-240. Materials Available for Modern Rolling Stock. Stephen H. Badgett. *Railway Mechanical Engineer*, v. 118, August '44, pp. 356-361.
Variety of materials has made possible the lightweight car. The future will offer still further weight-reducing designs.

23-241. Production of Tubular Railway Axles. H. A. Long. *Industrial Heating*, v. 11, August '44, pp. 1274, 1276, 1278, 1280, 1282, 1284, 1286.
Relative position of various units on the production line; equipment used.

23-242. Applications of High Temperature Conveyor Belts. II. S. Craig Alexander. *Industrial Heating*, v. 11, August '44, pp. 1242, 1244, 1246, 1248, 1250, 1252.
Woven wire conveyor belts for industrial applications.

24. DESIGN

24-36. Practical Application of Shop Mathematics. C. W. Hinman. *Steel Processing*, v. 30, July '44, pp. 432-435.
Covers a large assignment of the formulas used in designing tools and machines for processing metals and should be particularly helpful to the beginners in tool and machine designing.

24-37. The Use of Lateral Stiffeners. E. H. Windolph. *Iron & Steel Engineer*, v. 21, July '44, pp. 54-58.
Design and use of box girders.

24-38. Photographs Aid Presentation of Design Details. John W. Greve. *Machine Design*, v. 16, August '44, pp. 97-100.
Possibilities for use of photographs in the engineering department to conserve drafting and assembly time.

24-39. Direct Method Facilitates Helical Spring Design. R. G. Minarik. *Machine Design*, v. 16, August '44, pp. 145-148.
Design procedure.

24-40. Handsome Is as Handsome Does. Robert S. Schwachter. *Die Casting*, v. 2, August '44, pp. 68, 70, 72.
Diamond tool design.

25. MISCELLANEOUS

25-170. Air Expanded Plastic Rivets. *Iron Age*, v. 154, July 27, '44, pp. 52, 53.
Compressed air is used to expand a new type preheated hollow plastic rivet which can be used to attach fabric to metal, wood or plastic.

25-171. Plastics vs. Metals. Don Masson. *Mining & Metallurgy*, v. 25, August '44, pp. 369-372.
Wide use of plastics as substitutes an insignificant factor in metal tonnage—metal consumption may be stimulated.

25-172. Strength of New Plastics Compares with That of Metal. John Delmonte. *Machine Design*, v. 16, August '44, pp. 119-122.
Application of resins to laminates, curing conditions, disadvantages, properties, applications.

25-173. New Trimetric Drawing Technique. W. C. Wilkinson and H. C. Bartholonew. *Machine Design*, v. 16, August '44, pp. 139-140, 188.
A device for photographically translating a conventional orthographic drawing into a scale representation of one face or dimension of a trimetric projection. By adjusting the machine and the position of the print on the copy board in accordance with a predetermined scale, it is possible to produce the resulting print in any one of the three trimetric planes—plan, face or side—to fit the needs of each particular job.

25-174. Bits and Pieces. *Metal Progress*, v. 46, August '44, pp. 295-298.
Identification of Brinell balls. Spotting cobalt high speed. A film dryer. Sampling molten metals. Unusual type of precipitation. Wrought iron pipe replaces copper bus bars. An improved method of flow line etching for nitralloy. Simple die converts press into an upsetter.

25-175. Dust Collecting Systems. F. C. Morey. *Iron & Steel Engineer*, v. 21, July '44, pp. 45-51.
Recommended practices in the design and operation of dust collecting systems as applied to grinders, tumbling mills, sandblast equipment, mixers, crushers, etc.

25-176. Dust Control for Swing Frame Grinders. John M. Kane. *The Foundry*, v. 72, August '44, pp. 91, 206.
Use of booth type hood.

25-177. Gas Turbine Development — Past and Present. P. M. Heldt. *Automotive & Aviation Industries*, v. 91, August 1, '44, pp. 26-30, 54, 56, 58, 60, 64.
Applications, limitations, principles of operation, basic types.

25-178. Joining Aluminum Alloys. E. C. Hartman, G. O. Hoglund, and H. A. Miller. *Steel*, v. 115, August 7, '44, pp. 84-85, 122, 124, 126, 128, 132, 134, 136, 138.
Riveting methods.

25-179. Gas Turbine Developments. J. K. Salisbury. *Steel*, v. 115, August 7, '44, pp. 104, 106, 108, 146, 148.
Cause engineers to predict important fields in postwar cargo and transport aircraft. Approach to limit of gasoline engines comes in sizes (2000 to 8000 hp.) at which gas turbine becomes highly efficient power source.

25-180. Relative Costs of Parts Made by Five Different Methods. *Product Engineering*, v. 15, August '44, pp. 536-540.
Analyzes relative costs of parts made by forging, sheet-metal forming, screw machine, permanent-mold casting and flame cutting.

25-181. Packaging in Process Protects Precision Parts. *Iron Age*, v. 154, August 10, '44, pp. 50-51.
Corrugated tote box containing die cut pads or separators to protect parts in process cuts rejection rate for bronze bushings and bearings from 60 down to 5%.

25-182. Tiny Screw Assemblies. Carleton Cleveland. *Machine Tool Blue Book*, v. 40, August '44, pp. 241-242, 244, 246.
With the Pix-up Finder and Adjusto-Tray, screws are sorted, held in "heads-up" position, picked up entirely by mechanical (not magnetic) action, placed and driven, in what might well be classed as a single operation.

25-183. Prefabrication Methods in Aircraft Production. *Machinery* (London), v. 64, June 22, '44, pp. 673-675.
High rate of production due to the full utilization of the production line, and the extensive use made of templates.

25-184. Multiple Riveting of Aircraft Parts. J. E. Cooper. *Iron Age*, v. 154, August 24, '44, pp. 56-58.
Use of pressure rails or pressure pins prevents assemblies being misplaced between the anvils. With the aid of special handling equipment women operators have been able to upset rivets at the rate of 2300 per hr.

25-185. Jessop Steel Promotes Metallurgical Research by Erecting a New Laboratory. *Blast Furnace and Steel Plant*, v. 32, August '44, pp. 943-948.
General plan of building; planning and supervision; experimental heat treatment; sample preparation; metallography; special testing; quality control—routine testing and statistical analyses.

25-186. Maintenance Systems. Wm. A. Perry. *Blast Furnace and Steel Plant*, v. 32, August '44, pp. 958, 960-961, 977, 984.
Pump maintenance; plan for steam generator; plan for turbine generator; repairing steam turbine.

25-187. Metallurgical Aspects of the Bofors Anti-Aircraft Gun. Walter M. Mitchell. *Industrial Heating*, v. 11, August '44, pp. 1231-1232, 1234.
The general methods by which the manufacture of the Swedish Bofors was adapted to American practices and standards, and some of the metallurgical difficulties which were met and overcome.

25-188. The Ordered Flow of Materials at the Willow Run Plant. Franklin M. Reck. *Aero Digest*, v. 46, August 1, '44, pp. 68-74, 142.
System controlling the procurement, manufacture, and assembly of 2,500,000 parts.

26. STATISTICS

26-76. Lead—Past, Present, and Future. Clinton H. Crane. *Mining Journal*, v. 28, July 30, '44, pp. 6-7.
Higher lead and zinc prices are predicted for the postwar period when additional tonnages will be needed to meet world markets. The fear of competition from the plastics and the so-called lighter metals is unfounded.

26-77. An Iron and Steel Industry in the Northwest. David S. Tait. *Mining World*, July '44, pp. 24, 26.
High quality ore available; charcoal for fuel; cheap power prerequisite.

26-78. Stockpiling—Vital to National Security. Julian D. Conover. *Metals*, v. 14, July '44, pp. 6-10.
Costly experience in present war; stockpiles as insurance for future; disrupted effect of dumping; metal stocks are not surplus; immediate access to raw materials; opportunity to create permanent stockpiles; further purchases; legislative proposals.

26-79. Military Control Over Axis' Supply and Use of Metal in Post-War — Wise or Unwise? P. D. Merica. *Metals*, v. 14, July '44, pp. 11-13.
Any minerals control program should be limited to the assembling of adequate statistical information; information concerning production, distribution, and consumption of metals and metallic minerals.

26-80. What to Do About Maggie, the Metal. Walter A. Janssen. *Metals*, v. 14, July '44, pp. 14-16.
The post-war outlook for magnesium; price rise in last war; production in U. S.; exported in 1928; German production; affinity for oxygen; magnesium vs. aluminum; this war's influence; present production; world's largest producer; potential surplus available.

26-81. Prerequisites for Future Expansion of Western Steel Fabricating Industries. J. R. Mahoney. *Western Metals*, v. 2, August '44, pp. 26, 29.
Prewar capacities, construction steels, flat rolled products, postwar operation, strategic position, economic factors.

27. NEW BOOKS

27-95. Studies in Arc Welding. 1200 pp. James F. Lincoln Arc Welding Foundation, Machinery Publ. Co., Ltd., 17, Marine Parade, Brighton. Price 15s.

27-96. Maintenance Arc Welding. 234 pp. James F. Lincoln Arc Welding Foundation, Machinery Publication Co., Ltd., 17 Marine Parade, Brighton, England. Price 6s, 0d. net.

27-97. Elektrische Hochstspannungen. Albert Bouwers. 342 pp., illus. (Technische Physik, v. 1). J. W. Edwards, Ann Arbor, Mich. $9.00.

27-98. Die Metallverfluchtigungsverfahren mit besonderer Berucksichtigung der Herstellung von Zinkoxyd. Otto Barth. 262 pp., illus. (Metallhüttenpraxis in Einzeldarstellungen, v. 4.) J. W. Edwards, Ann Arbor, Mich. $5.40.

27-99. Air Conditioning and Refrigeration; 2nd ed. Burgess Hill Jennings and Samuel Richard Lewis. 533 pp., illus. International Textbook Co., Scranton, Pa. $4.50.
Revised to conform to new practices in air conditioning. The text has also been expanded in the field of refrigeration.

27-100. The Application of Radiant Heat to Metal Finishing. J. H. Nelson and H. Silman. 79 pp. Chapman & Hall, Ltd., 11, Henrietta Street, London, W.C. 2, England. Price 8s. 6d. net.

27-101. The Technology of Magnesium and Its Alloys. 512 pp. Translated from German by Technical Staffs of F. A. Hughes & Co., Ltd., and Magnesium Elektron, Ltd. Price 30s. net.

27-102. Photomicrography, in Theory and Practice. Charles Patten Shillaber. 781 pp., illus. John Wiley & Son, New York. $10.00.
A reference book on the theoretical and practical aspects of using the camera with the microscope. Microscope construction and operation; cameras and photographic technique; staining and mounting technique; glossary of optical terms.

27-103. Jigs, Tools & Fixtures. Philip Gates. 209 pp. Technical Press, Gloucester Road, Kinston Hill, Surrey, England. Price 14s. 0d. net.

27-104. Jig and Fixture Practice. H. C. Town. 113 pp., Paul Elek, Ltd., Africa House, Kingsway, London, W. C. 2, England. Price 10s 6d. net.

27-105. The Practical Sheet Metal Worker. Edited by J. S. Murphy. 384 pp. Odhams Press, Ltd., Long Acre, London, England. Price 8s. 6d. net.

27-106. Plastic Horizons. Benjamin Henry Weil and Victor John Anhorn. 178 pp., illus. (Science for War and Peace Series.) Jacques Cattell, Lancaster, Pa. $2.50.

27-107. SAE Handbook, 1944 Edition. 630 pp., Society of Automotive Engineers, 29 West 39th St., New York 18, N. Y. $5.00.
Standards, specifications and classifications. Reflects wartime industrial and technical progress in developing new methods and materials.

27-108. Seamless Steel Tube Data. 320 pp., looseleaf binder. Seamless Steel Tube Institute, Pittsburgh 19, Pa. $2.50.
General data on history, manufacture, tests, special shapes and standard steels. Uses, sizes and tolerances and standard specifications for mechanical tubing. Pressure tubing including boiler tubes, heat exchanger and condenser tubing, still tubes, alloy steel pipe, stainless steel analyses. Reference tables.

27-109. Basic Structures. F. R. Shanley. 392 pp., illus., John Wiley and Sons, New York. $4.50.
Forces and moments, force transmission, truss analysis, shear webs, torsion, combined shear and torsion, combined stress, etc. Presented with special reference to aeronautics. Appendix includes tables and diagrams relating to properties of materials under various conditions of stress and strain.

27-110. Colorimetric Determination of Traces of Metals. B. E. Sandell. 487 pp., illus. Interscience Publishing Co., New York. $7.00.
Methods for separation and isolation, and description of colorimetric reagents employed. Techniques used in determining traces of 47 different metals. Extensive bibliography.

27-111. Arc and Acetylene Welding. Harry Kerwin. 240 pp., illus. McGraw-Hill Book Co., 330 West 42nd St., New York. $2.50.
A well-organized introductory text. Directions and discussions are given for 41 lessons or shop exercises covering as many types of welding jobs and problems.

27-112. Schweisskostruktionen; Grundlagen der Herstellung, der Berechnung und Gestaltung; ausgefuhrte Konstructionen. R. Hänchen. 123 pp., illus. J. W. Edwards, Ann Arbor, Mich. $4.15.

27-113. Schweisstechnik im Flugzeugbau; 2nd ed. Kurt Queitsch. 160 pp., illus. J. W. Edwards, Ann Arbor, Mich. $6.55.

27-114. Komplexe Zahlen und Zeiger in der Wechselstromlehre. Max Landolt. 185 pp., illus. J. W. Edwards, Ann Arbor, Mich. $5.50.

27-115. Kerbspannungslehre. Heinz Neuber. 160 pp., illus. J. W. Edwards, Ann Arbor, Mich. $4.00.

27-116. Moderne Eisentherapie. Rudolf Stodtmeister and Peter Buchmann. 120 pp., illus. J. W. Edwards, Ann Arbor, Mich. $3.75.

German Books and Periodicals on Sale

Copies of numerous German technical, scientific, and medical periodicals and publications of research institutes are now being reproduced in America by photo-offset and circulated to subscribers. Likewise nearly 300 German books of fairly recent date, falling within those fields, have been similarly reprinted. ASMembers with ability to read German would do well to secure the complete lists of titles from the Alien Property Custodian, Washington 25, D. C.

Corrosion Panel Emulates Chicago Broadcasts

H. H. Uhlig

R. B. Mears

F. L. LaQue

Ever on the alert to improve the technical sessions at its national and chapter meetings, the American Society for Metals this year at the Cleveland convention during the week of Oct. 16 will stage a panel type of discussion of the kind used so successfully by the University of Chicago in its Sunday afternoon broadcasts. It will be held on Monday evening at 8:30 p.m., and the title of this discussion will be "What's New in the Study of Corrosion?"

The interlocutor, or master of ceremonies, will be Robert B. Mears, research chemist of Aluminum Research Laboratories, and past chairman of the American Coordinating Committee on Corrosion (an official group of national scope). Names of two of his experts on the panel can be announced and guarantee the timeliness and authority of the program: Herbert H. Uhlig, research metallurgist of General Electric Co., and F. L. LaQue, assistant director of technical service of International Nickel Co., and chairman of the American Coordinating Committee on Corrosion.

Mr. Uhlig's specialty on this program will be passivity and the stainless steels, and Mr. LaQue's will be nickel alloys, galvanic and marine corrosion. Authorities on such subjects as mechanism of corrosion, protective coatings, organic coatings, and light alloys and aircraft corrosion problems will also be present to participate in this unique discussion.

Shot for Metal Peening Described by Harder and Gow

The increase in interest in improving the fatigue endurance of metals and alloys by shot peening has served to focus attention on the shot used.

A paper on "Shot for Metal Peening" by Oscar E. Harder and James T. Gow of Battelle Memorial Institute, to be presented before the American Society for Metals on Monday morning, Oct. 16, is therefore particularly timely.

The materials which are known to have been used in metal peening include chilled iron shot, of the type used in metal cleaning, malleableized chilled iron, and a special heat treated shot. Typical chemical compositions and hardness values are given, and photomicrographs illustrative of the various materials are included.

The heat treated shot has improved resistance to fracturing in service and can be produced in hardness ranges suitable for the majority of metal peening applications but may find limitations with materials of high hardness such as about Rockwell C-50 to 55 and above, because as the hardness of the shot is increased into this range there is a loss in toughness.

This important new field of metal treatment will be further treated by the Society for Experimental Stress Analysis on Tuesday morning, Oct. 17, when O. J. Horger and H. R. Neifert of Timken Roller Bearing Co., will present a paper on "Shot Peening to Improve Fatigue Resistance".

Aluminum Forging Design, New Equipment Described

The rapid expansion of the aluminum forging industry in recent years has been accompanied by improvements in materials available for forgings and by development of more accurate knowledge regarding proper aluminum forging design. Very little information on this subject has appeared in technical literature—a lack which will be considerably rectified by L. W. Davis's paper on "Aluminum Alloy Forging Materials and Design" scheduled for presentation before the A.S.M. on Tuesday morning, Oct. 17.

The alloys available for forgings are enumerated and the advantages of each are indicated. A method of determining relative forgeability is described. This method permits evaluation of new forging materials and accurate comparison with other alloys.

New forging equipment has been developed especially to handle aluminum alloys. A description of a hydraulic forging press, a forging roll and other equipment is given.

The necessity for controlling flow lines and methods for accomplishing this control by means of forging technique and die design are shown. General rules for the design of aluminum forgings are enumerated, including draft angles, location of forging plane and parting line, size of fillets and radii and allowance for shrinkage. The effect of proper and improper design is demonstrated on typical forgings.

New Movie Shows Pouring of Metals

"The Flow of Metal Into Molds" is the title of a motion picture recently prepared by the Meehanite Research Institute of America, Inc. The film consists of two 16-mm. reels, without sound, and will be loaned to interested societies or groups on request. It is in color and shows the action of molten metal as it is poured into molds of various sizes and shapes.

Crowds Such as This Are Frequent During the Peak Hours of the War Conference Displays and Operating Exhibits at the National Metal Congress.

Eberbach and Tukon Testers Compared In Paper for A.S.M. Session

New fields of metallurgical research have been opened by the development of the Tukon tester and the Eberbach tester, which have extended the range of hardness tests to small areas, thin surface layers and brittle materials. The indentation numbers obtained with these machines are not, however, independent of load, a fact which makes advisable an examination of the reasons for this lack of uniformity.

Such an examination is described by Douglas R. Tate of the National Bureau of Standards in a paper entitled "A Comparison of Microhardness Indentation Tests" to be presented before a technical session of the A.S.M. on Thursday morning, Oct. 19.

Comparison data for the two testers throughout their common range of loads are presented and, in addition, theoretical reason and experimental evidence is advanced to show that Knoop indentation numbers are not based on unrecovered indentation areas. Recommendations are made for the specification of indentation numbers.

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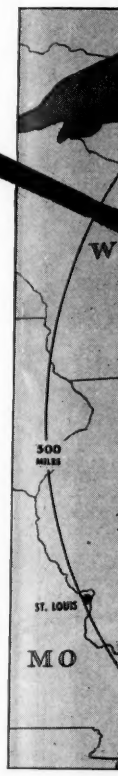

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Developments in Fabrication Of Magnesium Outlined

Constant development work on magnesium alloys is being conducted to simplify heating problems encountered in forming operations, to define more clearly the limitations of various metal working methods, to improve joining practice, and in general to establish the technique required to take full advantage of the high strength, low weight ratio of magnesium alloys.

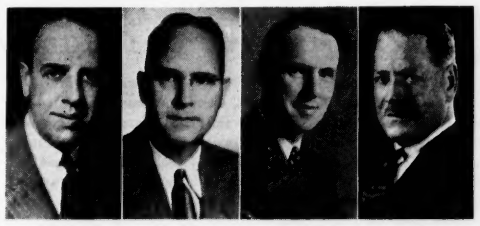
Some of the latest results of this development work will be described in "A Survey of Wrought Magnesium Alloy Fabrication" to be presented by J. V. Winkler of Dow Chemical Co. at a Monday morning technical session of the American Society for Metals. Mr. Winkler summarizes latest practice in shaping magnesium sheet and discusses various joining methods.

A second paper, scheduled for Tuesday morning, will cover an investigation of "Magnesium Sheet" by P. T. Stroup and G. F. Sager of the Aluminum Co. and J. B. West of American Magnesium Corp.

This paper presents a discussion on the relation of mechanical properties of magnesium sheet to aluminum content, zinc content, and cold work. Improved resistance to corrosion is shown to result from a decrease in iron content. Stress corrosion cracking can be overcome by means of "magclad" sheet.

The essential procedures for forming and joining operations are described, and the influence of both the favorable and unfavorable characteristics on commercial applications are reviewed.

A.S.M. Officers Installed at Annual Meeting

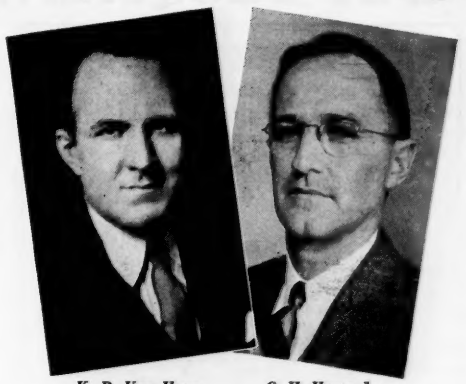


L. S. Bergen, Trustee — *R. W. Schlumpf, Trustee* — *A. E. Focke, Trustee* — *W. H. Eisenman, Secretary*

A unanimous ballot for the election of A.S.M. national officers will be cast by the secretary at the annual meeting of the Society on Wednesday morning, Oct. 18, in the ballroom of the Statler Hotel, Cleveland. The new officers were selected by the nominating committee last May, and in accordance with the constitution of the A.S.M., no additional nominations having been received by July 15, nominations were declared closed.

The new president of the American Society for Metals, who will take office at the annual meeting, is Kent R. Van Horn, research metallurgist, Aluminum Co. of America. Charles H. Herty, Jr., assistant to vice-president, Bethlehem Steel Co., will be vice-president, and William H. Eisenman has been re-elected secretary.

Two new trustees, elected to serve for two years, are



K. R. Van Horn, President-Elect — *C. H. Herty, Jr., Vice-President-Elect*

Lewis S. Bergen, associate director of metallurgy and research, Crucible Steel Co. of America, and Robert W. Schlumpf, metallurgical engineer, Hughes Tool Co. Arthur E. Focke, research metallurgist, Diamond Chain & Mfg. Co., has been appointed by the Board of Trustees to serve out the remainder of the unexpired term of Dr. Herty as a trustee.

Constitution Change to Be Voted

During the annual meeting the president, secretary and treasurer will give their reports covering activities of the Society during the past year. Two changes in the Constitution and By-laws of the Society will also be voted upon. These changes have to do with nomination of national officers and were published in full in the August issue of THE METALS REVIEW.

The meeting will be followed by the presentation of the Campbell Memorial Lecture by G. R. Fitterer, head of the department of metallurgical engineering at University of Pittsburgh.

In addition to the new officers named above, the Board of Trustees of the A.S.M. includes Harry D. McKinney, vice-president and works manager, Driver-Harris Co., who is national treasurer; Marcus A. Grossmann, director of research, Carnegie-Illinois Steel Corp, retiring president; and A. L. Boegehold, head, metallurgy department, Research Laboratories Division, General Motors Corp., trustee.

Vogelsang Plans Tin Meeting To Emphasize Short Supply

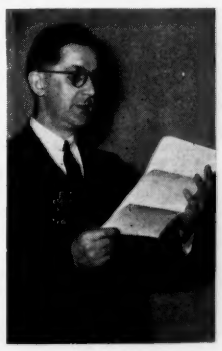
Cooperation of Governmental bureaus and the technical services in Army and Navy has always been generously tendered the A.S.M. Group Meetings, held at the annual Metal Congresses since 1941. The ability to stage an authoritative discussion on a question of utmost timeliness and importance to munitions production has been the unique feature of these meetings that has fostered, more than once, a rapid understanding between Government and industry.

A case in point will be the meeting on Tuesday evening, Oct. 17, at 8:30 p.m., to consider "Tin; Tin Alloys; Tin Coatings". Chairman of this meeting will be Erwin Vogelsang, who has been in charge of the tin program for the War Production Board since the beginning.

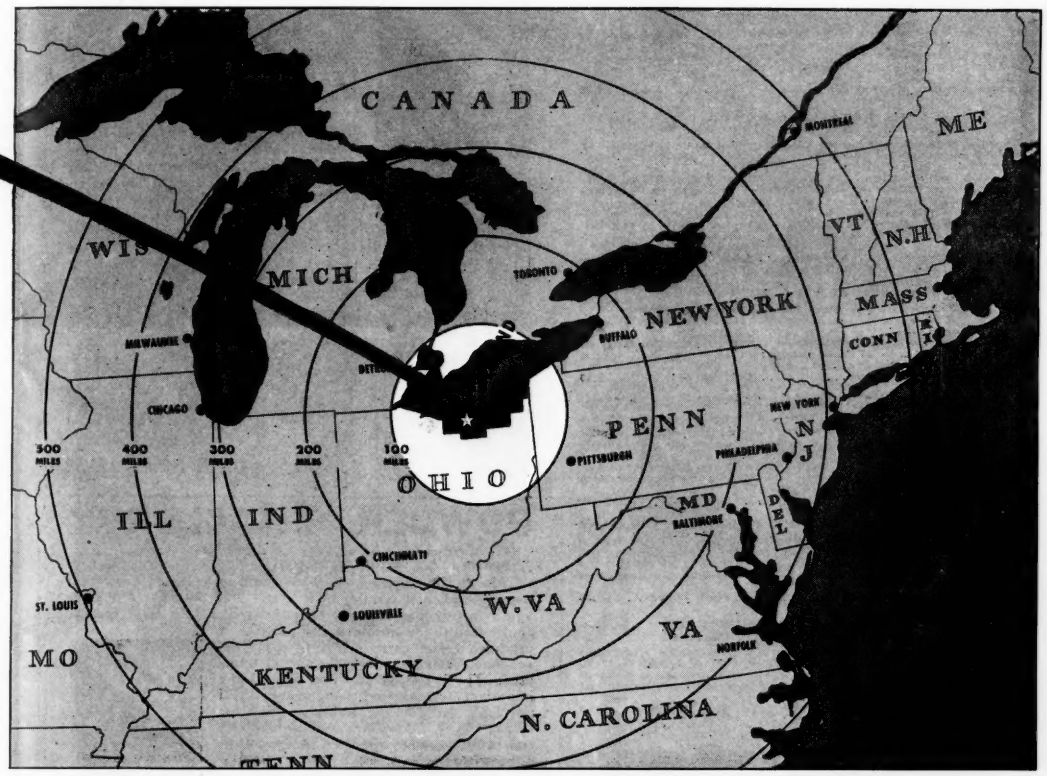
Mr. Vogelsang is hopeful that this discussion will re-impress all metallurgists with the fact that our tin supply is very, very short. The only reason we have been able to meet Army and Navy demands has been that we had a considerable stockpile of ingot metal, in America and afloat, when the Japs invaded Malaya.

The program on Monday evening, therefore, is devised to emphasize how A.S.M. members and metal consumers generally can conserve to the utmost this now precious metal.

Chapter Secretary for 20 Years



Twenty years' service as secretary of the Boston Chapter A.S.M. will be recognized when Howard E. Handy, metallurgist of Saco Lowell Shops, Biddeford, Maine, will be an honored guest of the Society during the week of the National Metal Congress in Cleveland, Oct. 16 to 20, 1944.



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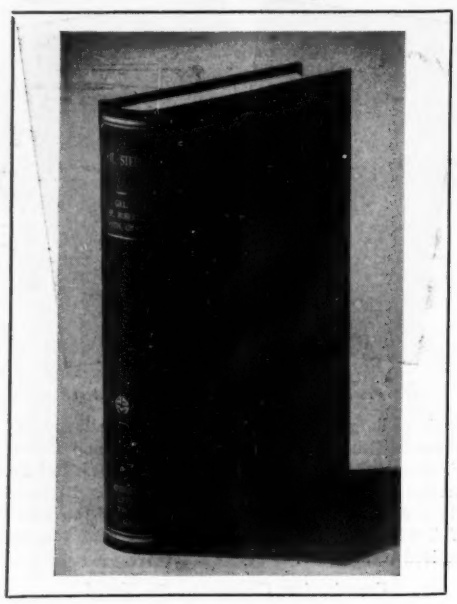

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Class 40 — Oil Hardening Non-Deforming Tool Steels
22-Page Bibliography, Many Others

THE PYROMETERY OF SOLIDS AND SURFACES
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This comprehensive book explains the scientific foundation of pyrometry of solids and discusses the pyrometry of metals by means of thermocouples, gas pyrometry, pyrometric controllers, soaking-pit pyrometry . . . heating and annealing pyrometry . . . radiational pyrometry of solids and surfaces . . . heating-furnace pyrometry . . . high speed pyrometry of surfaces . . . Rayotube-Speedomax pyrometer . . . optimatic pyrometer . . . single-cell vacuum-cell pyrometers . . . photronic pyrometers . . . open-hearth roof pyrometry . . . color pyrometry.

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INSPECTION OF METALS
by Harry B. Pulsifer, Metallurgical Engineer, American Metal Treating Co., and Consulting Metallurgist, Ferry Cap and Set Screw Co., Cleveland, Ohio.

To help speed inspection of metals used in the war effort, the American Society for Metals is making available at cost this new, authoritative 253-page book on metal inspection. Written in non-technical language by an authority in the field, "Inspection of Metals" is designed for those with a limited knowledge of metal-making practice and testing.

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ALLOY CONSTRUCTIONAL STEELS
by H. J. French, In Charge of Alloy Steel and Iron Development, International Nickel Co., Inc.

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PRINCIPLES OF HEAT TREATMENT
by Dr. M. A. Grossmann, Director of Research Carnegie-Illinois Steel Corp.

This book originally printed in 1935 was revised in 1937, and the 1940 edition has been greatly revised with an addition of some 100 pages. There are 10 chapters and an appendix under the following headings: Principles of hardening . . . variations of hardening . . . the process of normalizing . . . the process of tempering . . . transformation of austenite, the S-curve and austempering . . . heat treatment operation of case hardening . . . grain sizes, their manner of varying and their relation to hardening . . . heat treatment operation of annealing . . . equipment for heat treating . . . the iron-carbon diagram.

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PRACTICAL METALLURGY
by George Sachs, Case School of Applied Science, and Kent R. Van Horn, Aluminum Company of America.

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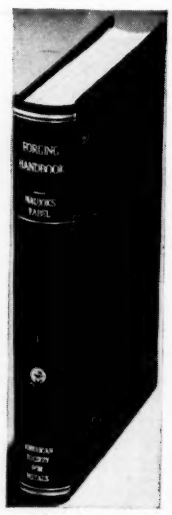

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Waldemar Naujoks, B.S., M.E.
Chief Engineer, The Steel Improvement and Forge Company
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by Gordon T. Williams, Metallurgist, Deere & Co., Moline, Ill.

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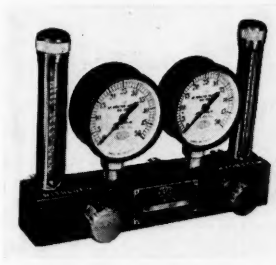
NEW PRODUCTS IN REVIEW

GAS PROPORTIONER

Air Reduction Sales Co.,
60 E. 42nd St., New York 17, N. Y.

This new piece of apparatus was developed to meet the demands of electronic tube manufacturers, heat treaters and others who use mixtures of gases for protective atmospheres. It is designed to produce an accurately proportioned mixture of such gases at a pressure not in excess of 5 psi.



This device consists of a mixing block incorporating accurately sized orifices on which are mounted flowmeters, pressure gages and needle valves for the gases as well as inlet and outlet nipples. It can be furnished with any two of six available flowmeters permitting a wide variation in the proportions of the two gases to be mixed. Flowmeters for hydrogen service cover a range from approximately 2 to 200 cu. ft. per hr. and for nitrogen the range is from approximately 6 to 140 cu. ft. per hr. The gases should be supplied through two-stage regulators capable of delivering the

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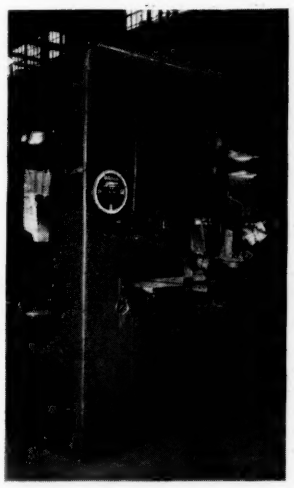
HIGH SPEED ALL-PURPOSE SAWING MACHINE

Continental Machines, Inc.,
1301 Washington Ave. So., Minneapolis 4, Minn.

The innovation of the variable high speed sawing machine marks an advance in the shaping of materials as a production time saver and enlarges the variety of materials which can be fabricated into useful products. Extensive tests indicate that increasing the saw band travel definitely increases production, improves the quality of the work, and produces a smoother finish. However, the speed control factor of saw band travel must vary considerably for the type of material being sawed.



To meet these varying conditions, this company is manufacturing a new high speed sawing machine known as the DoAll Zephyr. This machine features a 36-in. throat depth and 20-in. work thickness capacity with speed ranges of from 1500 to 10,000 ft. per min. A "Job Selector Dial" shows the saw control factors for the shaping of 104 basic materials. Extreme rigidity in the all-welded steel frame is the basis for the precision operation of the machine, keeping in true alignment the high velocity bearings which relay this smooth power through the variable speed pulley to the special adjustable saw guides. The machine is shipped complete with 20 assorted saw bands ready for operation. Available is a new leaflet giving further details.

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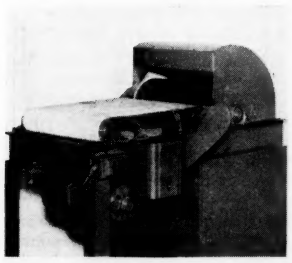
NEW DISINTEGRATOR INVENTED

Franklin-McAllister Corp.,
135 S. La Salle St., Chicago 3, Ill.

This new development in disintegration of materials was invented by M. C. Rawson. It includes a steel drum containing thousands of teeth on its outside diameter that will disintegrate almost anything that a steel saw will cut, including nickel, stainless steels and other metals and materials. Illustrated is a small, automatic feed unit with a 20-in. drum designed for a food product.



The company maintains a laboratory for the purpose of making sample runs to see what industries this new product will service and ordinarily makes no charge for this research. Fourteen disintegrators are already operating successfully powdering magnesium for incendiary bombs and other pyrotechnics.

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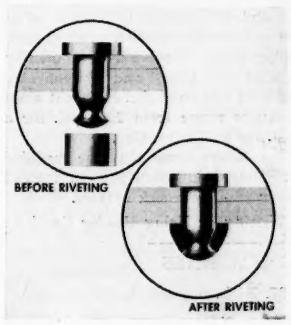
NEW HI-SHEAR FASTENER

Pheoll Mfg. Co., 5700 W. Roosevelt Rd., Chicago 50, Ill.

This company has been appointed prime licensee by North American Aviation, Inc. for the manufacture of the new Hi-Shear rivets. In comparison with both the bolt and nut and the ordinary rivet, it is claimed that Hi-Shears save assembly time, save materials, cut down weight, and cost less to use.

The rivet consists of two parts; the pin and the collar. The Hi-Shear rivet pin is made of alloy steel, heat treated to a minimum tensile strength of 125,000 psi. and cadmium plated. Since such hard material cannot be squeezed or hammered down to form a head, a malleable collar is provided. This collar is made of A 17 ST aluminum alloy anodized.



Although Hi-Shears are installed with riveting equipment, they are essentially threadless bolts. This governs all strength considerations, and shear strength is the same as that of the corresponding size standard aircraft bolt. Millions of these Hi-Shears are being used in present production by North American.

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METAL PROTECTIVE COATING

The Udylite Corp.,
1651 E. Grand Blvd., Detroit 11, Mich.

In solving new metal finishing problems, this company has developed and perfected equipment and processing for Dichromating of zinc coated steel and die cast parts. Dichromating is not new but in its original processing it presented so many difficulties and hazards that it is said to have been practically useless except as a hand dip coating of unpredictable quality.

New Udylite equipment plus a new cycle of processing has brought Dichromating to the stature of a real possibility in low cost, dependable finishes for everything from die cast zipper parts to steel shell cases.

Construction of the machine is based upon the discovery that absolute control of both time and temperature is vital in producing satisfactory results. Equipment is fully automatic. Parts are cleaned, rinsed, dipped, drained and dried continuously with no scratching or scarring.

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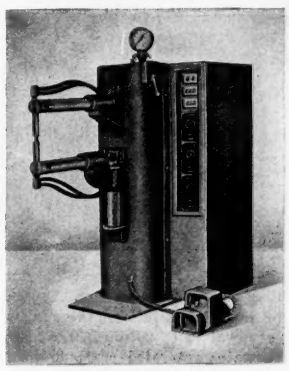
ROCKER ARM SPOT WELDER

Sciaky Bros., 4915 West 67th St., Chicago 38, Ill.

A new rocker arm spot welder for production sheet metal work provides a relatively small unit with features usually found only on larger machines. The upper arm is equipped with heavy duty roller bearings at the fulcrum point. The pressure cylinder contains a rubber bumper to eliminate hammering. Unit is entirely self-contained.



Operation is fully automatic with controls for welding heat, duration of current, cool period and off period. Welder is rated 30 kva. at 50% duty cycle with capacity on clean mild steel of from two thicknesses of 0.016 in. up to and including two thicknesses of 0.080 in., stainless up to a maximum of 0.040 in. plus 0.040 in. Speed on two thicknesses of 0.032-in. pickled mild steel is 180 spots per minute. Electrode pressure at 24-in. throat depth is 1000 lb.

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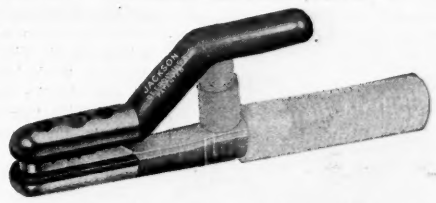
NEW TYPE INSULATOR

Jackson Products, 3265 Wight St., Detroit 7, Mich.



A new type of insulator to be used on their insulated tong-type arc welding electrode holders has been announced by this company. The manufacturer claims four definite advantages: (1) Metal-clad jaw covers (insulators) increase holder life and cut maintenance costs. (2) Arch construction assures greater strength. (3) Rounded surface tends to deflect heat and weld splatter. (4) Properly placed vents provide for free flow of air; there is no trapped heat.

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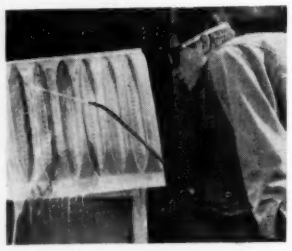
NEW PRODUCTS IN REVIEW

WATER-SOLUBLE PAINT STRIPPER

Turco Products, Inc.,
6135 S. Central Ave., Los Angeles, Calif.

This water-soluble paint stripper loosens paint for speedy removal with water. According to the manufacturer, the hosing off of an application of this stripper leaves a clean, paint free, water break free surface requiring very little after treatment to prepare for further processing.



Known as Turco Stripper L-780, the material is claimed to be non-corrosive on metals making it safe for use on any aircraft part or assembly and recommending it for the removal of zinc chromate primer as well as other paint coatings. Applied with brush or spray, the material is left on the surface until it tests ready for removal (5 to 20 min.). Loosened paint is scrubbed with a water saturated brush to form a slurry, which is then removed by hosing with water, steam, or air and water gun.

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FLAME PRIMING AND DESCALING NOZZLES

Victor Equipment Co.,
844 Folsom St., San Francisco, Calif.

With the current interest in flame priming and descaling for removal of rust scales from steel plate in preparation for painting, Victor introduces a new standard descaling device easily attachable onto any standard Victor welding torch butt. It can also be furnished with torch butt to those who are now owners of Victor equipment.

This priming and descaling nozzle is provided with an unusually well-designed spiral mixer and gas proportioner to handle with greater efficiency the larger gas volumes required for these operations.

In order to keep pre-mixed gases below ignition temperatures, even within the proximity of the ribbon flame and deflected heat, an Airadiator aluminum cooling section is incorporated at the nozzle head.

This nozzle is made in 4-in. (model 361) and 6-in. (model 362) ribbon flame widths. For inaccessible areas or rivet heads, a special type of circular multi-flame nozzle is provided by the manufacturer.

Mention R471 When Writing or Using Reader Service.

TWO-STATION HARDENING AND QUENCH TABLE

Induction Heating Corp.,
389 Lafayette St., New York 3, N. Y.

A general-purpose two-station hardening and quench table used in connection with high-frequency induction heating generators and suited to a wide variety of machine parts requiring surface hardening or localized heating is announced by this company.

The table is arranged with quick change coil connections so that jobs can be set up in 2 to 3 min. to change a heating coil. Only two coupling connections are required to the leads located at each outlet station.

Handling a wide range of work, it can be used either as a single purpose unit, using two identical fixtures, or it will serve as a general-purpose table for various kinds of hardening operations even where the lots may run as low as 6 or 12 pieces.

Initial timer is provided so that when a new part or a new job is to be induction treated, the heating time will be recorded, eliminating the need for a stop watch or other means of timing. After the initial heating time has been determined, the timer can be cut out by means of a selector switch included in the time assembly. The table is also equipped with a master three-stage timer which automatically controls the heating and quenching positions of the cycle. It is possible to incorporate a slight delay between the heating and quenching sequences, for the hardening of such parts as require this type of treatment.

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TWO NEW DIE CASTING MACHINES

Lester-Phoenix, Inc., 2711 Church Ave., Cleveland, Ohio

Two new high-speed, high pressure die casting machines, one for zinc, tin and lead alloys, and the other for aluminum, brass and magnesium alloys, have been developed by the Lester Engineering Co. for this organization. Both machines are readily convertible, from zinc operation to aluminum, and from aluminum to zinc. These machines are designed specifically for high production of smaller castings.

Without load, the zinc machine runs 750 cycles per hour and in actual operation, it makes 400 to 500 shots per hour, depending upon size of casting and its rate of chilling. The molten metal is injected by means of a submerged plunger and gooseneck injection system, consisting of a nitrided alloy steel cylinder, a hydraulically actuated plunger with cast iron rings, and a removable gooseneck and nozzle of heat and corrosion resistant alloy castings. Injection pressures range from 2200 psi. for a 4-lb. casting, to 1400 psi. for a 6-lb. casting.

The aluminum machine differs from the zinc machine in that it has a cold chamber injection system instead of the submerged plunger and gooseneck system.

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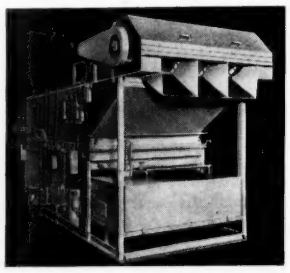
METAL CLEANING MACHINES

Detrex Corp., Detroit 27, Mich.

To facilitate the changeover from war to peace production, Detrex engineers have in many cases designed degreasers and washers to serve both applications with a minimum of rebuilding. The degreaser illustrated has three divisions which permit cleaning of assorted types and sizes of parts. Design of the machine was so coordinated to enable the manufacturer, whose business was in small automotive accessories, to install the machine for production cleaning of ammunition clips. No change whatsoever in construction of this degreaser will be necessary when the time for conversion arrives.



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STREAMLINED X-RAY UNITS

Kelley-Koett Mfg. Co., Covington, Ky.

Streamlined X-ray units designed for beauty and symmetry as well as full utility are included in current production of X-ray equipment for industrial applications by this company. This plant is said to have led the way in recognition of the inherent advantages of an X-ray cabinet over a separate lead-lined room for radiographic work. Tailoring cabinets to meet the specific needs of the industry served and the size of the units to be contained, Kelley-Koett engineers have built the equipment to fit the need and use.

Where mass production was the problem, means for mass inspection have been designed and built into the cabinets. This requires a unit that handles parts in an uninterrupted flow and still provides the operator with a radiographic technique comparable to that obtained in the laboratory.

In the development of a fluoroscopic unit for industrial users, the same production principles have been maintained. A recent development is the combination radiographic and fluoroscopic cabinet. Where it is necessary to position the X-ray tube over the dolly for radiography and over the fluoroscopic screen for visual inspection, horizontal travel has been provided for the tubehead mounted in the top of the cabinet. A mirror has been placed at 45° to give the observer a reflected image and to put him outside the path of the direct beam. Another accomplishment was the use of a flawless lead glass viewing-window, specially treated to provide a non-reflecting surface, at convenient eye-level for a seated operator. A sliding access-door enables the operator to place the samples over the screen, and a convenient, lead-protected hand hole with tongs for manipulating the sample completes the setup.

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IMPROVED A.C.-D.C. ELECTRODE

Air Reduction, 60 E. 42nd St., New York 17, N. Y.

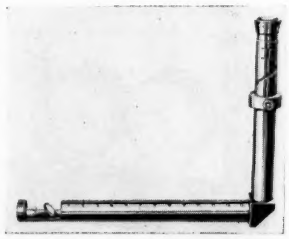
Airco No. 90-A electrode, an improved version of the smaller sizes of No. 90, has just been introduced by this company. This electrode is especially designed for welding light gage chromium-molybdenum and similar steels used in aircraft welding. It is made to a completely new coating formula that provides notably smoother arc operation plus better appearance of deposits, stronger arc action, reduced slag interference. Equally efficient for both A.C. and D.C. operation, straight or reversed polarity, the electrode is available in 1/16, 5/64, and 3/32-in. diameters.

Mention R476 When Writing or Using Reader Service.

BORESCOPES FOR INTERNAL SURFACE INSPECTION

Polan Industries, Huntington 19, W. Va.

Originally designed for the internal surface inspection of gun bores, these Borescopes are now available for use by private industry. They have solved the problem of making the surface of long bores accessible to the human eye in order to inspect for minute cracks or other surface faults which may cause failure in operation.



Borescopes are recommended particularly for close scrutiny of internal surfaces of bored engine shafts, tubular bodies, hydraulic and other cylinders, etc., and will cover a diameter range from 13/16 in. to 9 in., and a bore length up to 30 ft.

A complete line of these industrial telescopes has been developed. The instruments combine the qualities of a highly corrected lens system and of excellent interior illumination with the demand for rugged design which is necessary for every-day machine shop use. The instruments will supply a clear and magnified view of bore surfaces. They do not strain the inspector's eyes when operated continuously, and require no special operator training.

A number of special Borescopes and a wide variety of special attachments have been developed and described in a bulletin obtainable upon request.

Mention R477 When Writing or Using Reader Service.

FAST-DRYING RUST INHIBITOR

Witco Chemical Co.,
295 Madison Ave., New York 17, N. Y.

Known as Witco No. 673, this new rust preventive coating protects metal parts and equipment during storage, shipment, and, in some cases, in service. It is a cold-dip, rapid drying coating that may be applied either by dipping or spraying, as its viscosity is comparable to that of water. It conforms to Ordnance Specifications AXS-673, Rev. 1, Amend. II, is non-abrasive, non-corrosive and easily removed with ordinary solvents. It has an extremely high melting point in excess of 250° F. and yet the coating remains flexible at temperatures of 20° below zero. Product is packaged in 55-gal. drums.

Mention R478 When Writing or Using Reader Service.

ORGANIC FINISHING OF COPPER ALLOYS

Enthone Company, Elm St., New Haven, Conn.

In the preparation of copper alloys for painting, lacquering and enameling, it has been difficult to obtain good adhesion of organic finishes. It has been found that the Ebonol "C" process will produce a stable, adherent nonreactive cupric oxide coating on copper alloys that gives high adhesion of lacquers, paints and enamels under severe weathering conditions.

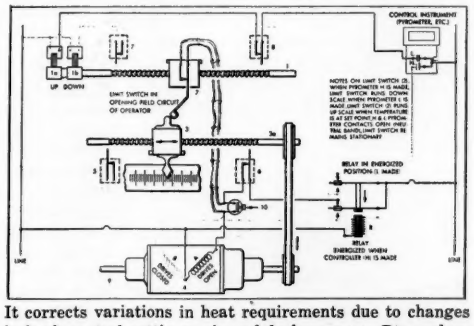
The finish obtained is nap-like in nature presenting a relatively absorbent base for the paint to be anchored. Finish is applied by simple immersion of the work in a dilute solution of the salts operated near 210° F. Treating time is approximately 10 min.

Mention R479 When Writing or Using Reader Service.

SIMPLIFIED VALVE-POSITIONING DEVICE

Wheelco Instruments Co., Chicago 7, Ill.

Designed to correct variations in heat requirements of furnaces and process equipment by positioning a valve in the fuel line, the "Throttltrol" is designed for use with any control instrument having a high and low contact.


CONTROL INSTRUMENT (PYROMETER, ETC.)
UP
DOWN
LIMIT SWITCH IN OPENING FIELD CIRCUIT OF OPERATOR
RELAY IN ENERGIZED POSITION IS MADE
RELAY ENERGIZED WHEN CONTROLLER IN IS MADE
LINE

It corrects variations in heat requirements due to changes in load, control settings, air and fuel pressure, Btu. values and combustion efficiency.

At a given setting, it will permit a fuel valve to open only the desired distance when the two-position control instrument is in its "on" position. In this manner, it permits a more even and constant flow of fuel to the burner and minimizes the danger of "overshooting" that is apparent in two-position controllers when the fuel supply is either full on or entirely off.

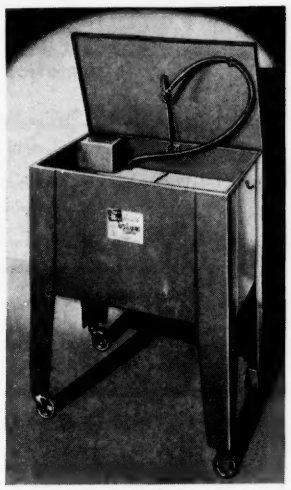
Mention R480 When Writing or Using Reader Service.

NEW PRODUCTS IN REVIEW

PARTS CLEANING SYSTEM

Gray-Mills Co., 1948 Ridge Ave., Evanston, Ill.

A new parts cleaning system, combining the utility of two washers into one self-contained portable unit, has been announced by this company. System includes a portable cleaner with a unique swisher feature and cold-cleaning Flo-Bac Solvent.



Large parts, requiring individual handling, are cleaned of grease and grime by a strong stream of solvent pumped from the tank below. Smaller parts may be washed in quantity by merely pouring them into a basket and immersing in solvent. A two-section shelf may be removed, giving access to the dipping tank below. The dipping basket rests on a simple, hand-operated swisher device, which speeds the cleaning operation by providing a convenient method for agitating fluid.

Mention R481 When Writing or Using Reader Service.

NEW TUBE BENDER

Leonard Precision Products Co.,
1100 Larson Ave., Garden Grove, Calif.

A new manually operated tube bender, which will produce 900 to 1000 bends per hour, has been designed by the Douglas Aircraft Co. and is now being manufactured under exclusive license by Leonard. Under actual operating conditions, the machine has produced better than 1000 tubing bends per hour. At minimum operating efficiency its production is 2½ to 3 times as fast as the best methods that have been available to this time, it is said.

The Bendmaster, as it is named, will handle non-ferrous tubing from ⅜ to 1¼ in. o.d., producing from one to ten different bends in a single 9-ft. length of tubing. These bends can be produced to any specified angle up to 180° and at any radial angle. Special models for tubing up to 20 ft. are available for special jobs. Set-up time of the new machine averages 7 to 15 min. The machine cam arrangement and automatic stops are adjusted according to specifications on the job ticket.

Mention R482 When Writing or Using Reader Service.

SHELL INSPECTION LIGHT

Trimount Instrument Co.,
37 W. Van Buren St., Chicago, Ill.

A new light designed for inspection of shells, barrels, forgings, etc., consists of a small, standard 110-volt bulb mounted in a 30-in. or longer tubular fiber handle, with 6-ft. extension cord. Bulb is protected by a plastic guard. This model is standard for internal inspection of 8-in. shell forgings both before and after machining. Units are available both non-vapor-proof and explosion-proof.

Mention R483 When Writing or Using Reader Service.

A.C.-D.C. STAINLESS STEEL ELECTRODES

Alloy Rods Co., York, Pa.

A new stainless steel arc welding electrode, one rod that performs equally well on A.C. or D.C. in all positions, has been developed by this company. All stainless steel analyses are now available. They have exceptionally low spatter loss, easily removed slag, and instant arc establishment. Welds made in the flat, vertical and overhead positions are of accepted contour. Physical and corrosion resisting properties will meet all requirements.

Mention R484 When Writing or Using Reader Service.

NEW SAFETY GOGGLES

American Optical Co., Southbridge, Mass.

Two new Ful-Vue acetate safety goggles are announced as extremely light in weight without sacrificing strength. Developed for general industrial use after two years of exhaustive experimentation, the new plastic goggles are good looking, meet exceptionally high standards of eye protection, and because of their lightness will satisfy those workers who sometimes are negligent about wearing heavier-type goggles. Said to be excellent fitting and spark-proof, the goggles are of rugged construction with a stronger, more massive front than ordinary acetate goggles patterned after zylonite spectacles. One of the new goggles is available in a pink crystal color with white or Calobar 6-curve Super Armorplate lenses. The second goggle is fitted with side shields and comes in a pink crystal color with white 6-curve Super Armorplate lenses—or in a green color with Calobar 6-curve Super Armorplate lenses.

Mention R485 When Writing or Using Reader Service.

PORTABLE WELD TESTING MACHINE

Air Reduction Sales Co.,
60 E. 42nd St., New York 17, N. Y.

A new and improved portable weld testing machine has just been introduced by this company. Moderately priced, this machine is said to be the only available portable unit that performs all these three weld tests: (a) Reduced section transverse tension test; (b) guided bend test (a complete 180° face or root bend); (c) longitudinal all-weld metal tension test (0.505 in.).

The machine provides accurate data on tensile strength and ductility of weld specimens, as determined by the three tests. It is relatively light in weight which enables users to perform weld tests right on the job.

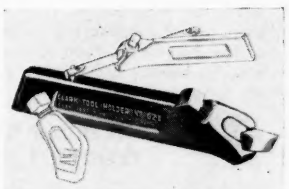
The machine operates on the principle of the hydraulic jack. A hand-operated pump transmits pressure through a hose to the plunger. While the maximum direct load is 40,000 lb., the use of reduced section specimens permits tests on metals of 150,000 psi. or higher tensile strength. Jaws for making the transverse tension test, and plunger and die for the guided bend test, are supplied with the machine. Jaws for the longitudinal all-weld-metal tension test are furnished on special order. All standard equipment is installed in an oak cabinet which serves as a practical container for storage and shipment. An illustrated booklet ADI-889 describes construction and operation of this new machine.

Mention R486 When Writing or Using Reader Service.

ADJUSTABLE TOOL HOLDER

Robert H. Clark Co.,
9330 Santa Monica Blvd., Beverly Hills, Calif.

A new adjustable tool holder with a vise grip for use in lathes, shapers and planers is announced by this company. The Clark principle of adjustability makes possible the use of any of four or more sizes of tool bits in the same holder instead of requiring a separate holder for each size, thus saving the mechanic's time by enabling him to change bit sizes without changing holders. Models available are the 15° sloping cutter channel type and the horizontal or parallel channel type in both right and left hand offset. Each type is available in several shank sizes.



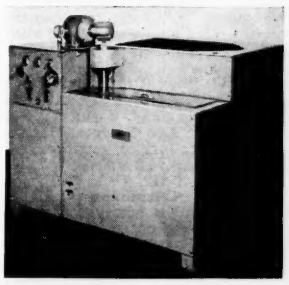
In addition, this tool holder has a special vise grip jaw which has a unique clamping action for holding the bit vertically and horizontally with pressure evenly distributed over the entire holder channel, thus preventing tool bit breakage. It completely eliminates the possibility of a pocket or sag developing in the bottom of the holder channel, which is said to be a frequent source of trouble when tool bits are clamped with a screw contact at a single point. Sizes and prices are available.

Mention R487 When Writing or Using Reader Service.

ETHYL CELLULOSE MELTING AND DIPPING TANK

Youngstown Miller Co., Sandusky, O.

All the requirements set up by the manufacturers and Ordnance for control are said to be met by this ethyl cellulose melting and dipping tank. This machine is now in operation and is being used to dip spark plugs at the rate of 4500 plugs per hour. This Model 60 has a capacity for 100 lb. of plastic per hr. Units are available with smaller capacities and in larger sizes and with various dimensions of the dipping compartment.



Indirect heat is employed. Thermostatic control is maintained over both the heat exchange medium and the plastic to insure that neither rises over its maximum allowable temperature. The plastic is melted and preheated to proper temperature for dipping before entering the dip tank. Extremely close control and uniformity of temperature are achieved with low heating surface temperature.

Mention R488 When Writing or Using Reader Service.

NEW INFRA-RED LAMP

Wabash Appliance Corp.,
335 Carroll St., Brooklyn 31, N. Y.

A new 375-watt reflector type infra-red heat lamp has been added to the Birdseye line offered by this company. New lamp is made in clear and ruby glass. This higher wattage is designed to produce higher drying temperatures not possible with available 250-watt sizes, it is said.

Mention R489 When Writing or Using Reader Service.

SURFACE GRINDER

Continental Machines, Inc.,
1301 Washington Ave. So., Minneapolis 4, Minn.

This new model G-1 DoAll surface grinder is said to offer latest scientific developments in balance and construction which give this grinder new achievements for precision grinding and fine finish. Grinder has a dependable accuracy which enables even "green" operators to rely on the machine for constant fine work. With standard grit wheels, the machine produces a fine finish to within six micro inches.

Built for tool room use and light production work, it has a table travel of 21 in. and transverse travel of 7½ in. with a vertical wheel head adjustment of 12 in., using a 7x½x1¼-in. wheel. Extreme rigidity so important to precision finish is found in the scientific balancing of the 2200-lb. weight of the machine.

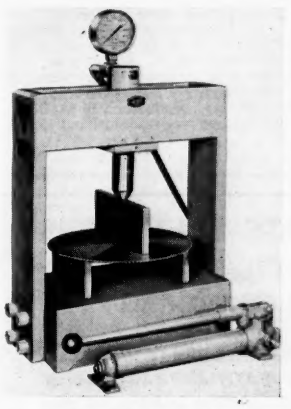
An especially constructed combined hydraulic control unit eliminates all piping; it controls the five hydraulically actuated movements of the machine and was designed especially for this grinder so that no adjustments are necessary.

The grinder is especially designed for efficient wet or dry grinding, and for automatic hydraulic feed or smooth-operating manual feed.

Mention R490 When Writing or Using Reader Service.

LABORATORY PRESS

Anderson Bros. Mfg. Co.,
1907 Kishwaukee St., Rockford, Ill.



This new laboratory press has a total capacity of 20 tons and a stroke of 5 in. The table is 12 x 20 in. and is accurately machined. Power derives from a hydraulic hand pump, a unit proved by use on Anderson's standard hand presses.

This unit can also be used for many production straightening jobs such as large sprockets, gears and plates. Weight of the press is 400 lb.

Mention R491 When Writing or Using Reader Service.

NEW DIAMOND WHEELS

Industrial Abrasives, Inc.,
3724 W. 38th St., Chicago, Ill.

Something new in diamond wheels—the Zurium bonding process for locking diamonds firmly and securely in the wheel—is announced by this company. This new bonding principle has been perfected by the use of Zurium which has already proven successful in the Super Cut diamond wheels, it is said. Under ordinary care in operation, the new Super Cut wheels are said to hold up under the toughest applications on carbide tool grinding and finishing. Each wheel is capable of grinding several thousand carbide tools. A question and answer brochure on diamonds in industry is free on request.

Mention R492 When Writing or Using Reader Service.

SPOT WELDING TIMER AND HEAT CONTROL

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Suitable for welding small objects of high conductivity such as aluminum or copper, a new precise welding timer with heat control for timing intervals of one-half cycle or less is announced by this company. Precise, because the welding current is made to start at the same point on the voltage wave for every operation, the new SP-18, ½-cycle timer is designed for welding of such items as radio tube parts and sockets, pig-tail resistors to terminal lugs, watch and instrument parts, contact tips on electrical relays and other small parts.

The timer is furnished as a separate control for use with existing small bench welders and also in combination with a small welding transformer. Only one control tube is used, this thyratron serving the dual purpose of rectifying alternating current to charge a firing capacitor and also firing the small ignitron power tube. Heat control is accomplished by a phase shift method, the adjustment dial for which is mounted on the cabinet door.

Mention R493 When Writing or Using Reader Service.

List of Exhibitors— *What They Will Exhibit . . . . . Who Will Be in Attendance*

Aber Engineering Works, Inc., Waterford, Wis. Booth H-627.
Exhibiting: One exhibit table with rotating shaft upon which are assembled various types of Curved Tooth Milling Cutters. Display board with various Curved Tooth Milling Cutters of following types: Woodruff Keyway Cutters, Plain Milling Cutters, Staggered Tooth Side Milling Cutters, R & L Hand Shear Side Milling Cutters, R & L H Half Side Milling Cutters and two different types of Overlapping Side Milling Cutters. Also a standard model of the Aber Cherrying Attachment.
In attendance: Earnest F. Aber, president and manager; Bert D. Horth, chief engineer; William C. Smith, superintendent; Terry M. Finn, Leonard H. Thomson, and H. Colby Rowell, salesmen.

Acme Tool Co. Booth A-620. (See **H. & H. Research Co.**)

Aget-Detroit Co., Ann Arbor, Mich. Booth K-615.
Exhibiting (in operation): Portable, entirely self-contained dust collectors suitable for collecting the dust, abrasive, lint, etc., from all kinds of dry grinding, sanding, polishing, and buffing operations as well as shavings and sawdust from woodworking equipment. Models 600, 950, and 1250 Dustkop dust collectors with various types of accessory equipment for special requirements will be in operation. These collectors represent a complete line capable of collecting dust from the smallest dry grinder to the largest industrial type double end disc grinder.
In attendance: H. L. Gilmore, factory manager; Gorman Burd, chief engineer; E. E. Buskirk, general manager; W. A. Dexter, field engineer; Alfred B. Hard.

Ajax Electric Co., Inc., Philadelphia. Booth C-340.
Exhibiting (in operation): A full-size operating unit and two additional standard Ajax-Hultgren electric salt bath furnaces. Equipment is suitable for heat treatment processes from 350° to 2400° F., including isothermal heat treatment (martempering, austempering, cyclic annealing), carburizing, simultaneous brazing and carburizing, cyanide hardening, neutral hardening, differential heating, heat treating aluminum alloys, tempering, hardening high speed steel tools, annealing (stainless), annealing (ferrous and non-ferrous), brazing, heating for forging.
Photo-murals and pictorial diagram in motion, showing operating principle of electromotive bath circulation and variety of installations. A great number of parts heat treated in these furnaces, including gun and ordnance parts, AP and HE shells, high speed steel tools, tractor, automotive, and airplane engine parts, aluminum sections, homogeneous and carburized armor plate, stainless steel wire, rod, etc.
In attendance: Dr. G. H. Clamer, president; William Adam, Jr., vice-president; J. E. Haig, secretary; L. B. Rosseau, assistant vice-president; H. J. Babcock, Research engineer; H. L. Edsall, advertising manager; Schuyler Yates, Otto P. Kossatz, C. B. Fall, and J. E. Bullock, representatives; A. A. Anderson, E. E. Bolds, and R. H. Perry, Cleveland representatives; R. S. Brown, and A. R. Yerkes, representatives.

INVESTIGATE SALT BATHS!

You can't miss the Ajax Booth C-340
MAIN EXHIBIT HALL

***SEE THE AJAX-HULTGREN INTERNALLY HEATED SALT BATH FURNACE,* which has made heat treating history for the past eight years, with nearly two thousand *INSTALLATIONS* for**

Carburizing — Neutral Hardening
Cyanide Hardening — Selective Heating
Age Hardening — Tempering

Hardening High Speed Steel Tools

Heating for Forging
Brazing . . . and many others

LATEST DEVELOPMENT — AJAX ISOTHERMAL HEAT TREATMENT—FULLY EXPLAINED

This original development provides the heat treater with a new tool of mass production . . . opens out tremendous new range of available physical properties in parts to meet postwar competition.

AJAX ELECTRIC COMPANY, INC.
Philadelphia, Pa.

Mention R494 When Writing or Using Reader Service.

Ajax Electrothermic Corp., Trenton, N. J. Booth D-331.
Exhibiting: Ajax-Northrup high frequency induction melting furnaces for high-grade steel alloys, centrifugal castings, and non-ferrous metals; also, high frequency induction units for hot forming, for brazing, heating for forging, as well as the application of the original Ajax-Northrup principle to experimental and development work.
Photo murals, showing operation and principle of Ajax-Northrup high-frequency melting and heating furnaces. Also specimen alloy castings; carbide and tungsten cutting tools; shells and forgings, non-ferrous castings (high pressure); metals developed in the Ajax furnaces.
In attendance: G. H. Clamer, president; Robert N. Blakeslee, vice-president; A. Dean Meyer, treasurer; Frank T. Chesnut, secretary; George F. Applegate, electrical engineer; Harry G. Remmers, electrical engineer; T. R. Kennedy, research engineer; Howard Linn Edsall, advertising manager.

Ajax Engineering Corp., Trenton, N. J. Booth C-330.
Exhibiting: One full-size Ajax-Tama-Wyatt aluminum melting induction furnace suitable for foundries, rolling mills, die casting plants. Photo-murals and pictorial diagram, showing operating principles and variety of installations for rolling mills, aircraft engine parts foundries, scrap recovery, electric control panels. A variety of aluminum parts cast from Ajax induction furnaces, including pistons, engine parts, cut and polished as-cast ingot sections, etc.
In attendance: G. H. Clamer, president; Manuel Tama, vice-president; Mario Tama, secretary; A. A. Coley, plant manager; H. L. Edsall, advertising manager.

A Compact, Low-Cost
INDUCTION FURNACE
for
MELTING ALUMINUM ALLOYS

Will be on Display
at the Ajax Booth C-330
Main Exhibit Hall

Learn why other plants have consistently developed vastly increased physicals in rolling mill, die cast, or aluminum foundry products . . . with decreased gas absorption, absence of all segregation, and elimination of oxide inclusions.

SAMPLES WILL BE SHOWN

Clean-cut temperature control, great ease and simplicity of handling are operating characteristics of the Ajax-Tama-Wyatt Furnace. It will give you a cooler foundry and a better product, as you may see for yourself.

AJAX ENGINEERING CORPORATION
TRENTON 7, N. J.

Mention R495 When Writing or Using Reader Service.

Allen Manufacturing Co., Hartford, Conn. Booth E-137.
Exhibiting (in partial operation): Set screws, square head set screws, socket head cap screws, flat head cap screws, shoulder screws, pipe plugs, dowel pins, keys, key sets and assortments.
In attendance: W. D. Horner, C. T. Schnell, G. Arbuthnot, C. H. Beckman, E. Brash, H. Michgelson, G. J. Lewis, W. J. McRae, E. R. Lafferty, W. G. Taylor, and H. D. Cram, district representatives; W. C. Waldo, vice-president in charge of sales.

Allison Co., Bridgeport, Conn. Booth D-315.
Exhibiting (in operation): Two abrasive cutting machines.
In attendance: W. R. Haight, vice-president; Paul R. Shuttleworth, vice-president; Grant J. Casserly, sales engineer; Frederick Shackleton, sales engineer.

Alloy Casting Co., Champaign, Ill. Booth C-113.
Exhibiting: Heat and corrosion resistant castings made by new pressure-cast and "Zirco-Chill" processes as supplied to Leeds & Northrup Co. Containers and fixtures for heat treating processes, cyanide and lead pots, furnace parts and mechanism. This company specializes in large, accurate castings to thin wall section and close metallurgical specifications. Nickel-chrome and chrome-nickel castings in many forms.
Caterpillar tractor boxes, Lindberg engineering fixtures, Chrysler furnace parts and a variety of alloy tooling for handling ordnance materiel, war production heat treating, etc.
In attendance: Roger Waindle, general manager; Frank Staral, assistant chief engineer; M. C. Schwer, manager Detroit office; Peter Paige, designing engineer; Roy Kruck, foundry superintendent; Leo Bridges, Charles Webb, and Jean DeJarnett, metallurgical engineers.

Alloy Rods Co., York, Pa. Booth E-642.
Exhibiting: New Arcaloy AC-DC stainless steel arc welding electrode. Any stainless analysis Arcaloy AC-DC electrode will weld in any position with either AC or DC current. New Arcaloy tool steel arc welding electrodes.
Available at booth are samples of new AC-DC stainless electrode; samples of new tool steel welding electrode; new Arcaloy color chart of chemical analysis of weld deposits and welding current ranges for all welding positions; new catalog of Arcaloy tool steel welding electrodes; samples of DC stainless electrodes both lime and titania coating.
In attendance: E. J. Brady, president; Ed. Foote, manager, tool steel division; Louis J. Marini, general manager; Marvin G. Sedam, research director.

Alox Corp., Niagara Falls, N. Y. Booth D-413.
Exhibiting (in operation): New types of Alox preservative lubricants suitable for lubrication and preservation of metal from temperatures ranging from —80° F to 200° F. Demonstrations showing the ability of these materials to protect metal in sea water and continuous exposure to wet atmosphere. New types of rust preventives for ball and roller bearings. New types of basic inhibitors suitable for the preparation of various kinds of preservative lubricants and film-forming rust preventives on display for the first time.
In attendance: William H. Clark, president; A. W. Burwell, vice-president and technical director; James E. Shields, sales manager; T. R. Whittleton, research chemist; B. G. Spice, midwest sales manager.

ALOX PRODUCTS

Call at Metal Show Booth No. 413

For Information On —

Alox L-1413—Preservative lubricant for lubrication and preservation of small arms.

Alox L-1419—Preservative lubricant for lubrication and preservation of medium-size arms.

Alox L-1436—Preservative lubricant for lubrication and preservation of large-size arms.

These lubricants preserve metal against corrosion from sea-water and wet atmosphere. See demonstration at Booth No. 413.

ALOX CORPORATION
Manufacturers of basic inhibitors, rust preventives, oiliness compounds, penetrants all from petroleum.
Laboratory and Factory—
Buffalo Avenue, Niagara Falls, N. Y.
Main Office—
4001 Sixty Wall Tower Bldg., 70 Pine St., New York, N. Y.

Mention R496 When Writing or Using Reader Service.

Aluminum Co. of America, Pittsburgh. Booth A-621.

Aluminum Industries, Inc., Cincinnati, Ohio. Booth A-413.
Exhibiting: Display of Permite Aluminum Alloy Castings for aircraft, automotive and industrial application; Permite Steel Screw Machine Parts; and Permite Ready-Mixed Aluminum Paints and Industrial Finishes.
In attendance: M. M. Carmody, sales manager, paint division; M. G. Robinson, sales engineer, paint division; Bruce V. Keller, advertising manager; W. J. Klayer, chief engineer; R. G. Tessendorf, sales manager, industrial division; B. J. Plumley, district manager, industrial division; C. C. Rensing, sales engineer, industrial division.

Alvey-Ferguson Co., Cincinnati, Ohio. Booth F-162.
Exhibiting (in operation): One full size metal products cleaning machine with vision panels and marine lights to observe operation. One miniature conveyor system of roller gravity, power booster and live roller conveyor. Photographs of various installations. Advertising literature.
In attendance: Donald P. Smith, manager, metal products cleaning and finishing equipment division; L. J. Stigler, sales engineer; C. L. Koehler, sales manager, conveyor division.

American Brake Shoe Co. Booth B-122. (See **American Manganese Steel Division** and **Electro-Alloys Co.**)

American Chain & Cable Co., Inc. Booth D-321. (See **Campbell Division, Andrew C.**)

American Car and Foundry Co., New York City. Booth A-318.
Exhibiting (in operation): No. 2 two-electrode rivet heater; soldering heater; fully automatic heater; ring heater.
In attendance: F. C. Cheston, sales agent; H. C. Cheston, sales agent; W. J. Bisset.

American Cyanamid Co., New York City. Booth H-601.
Exhibiting (in operation): Formal announcement of a new series of heat treating products being offered under the trade name of Aeroheat. (Trade mark registered.) This new group of products for salt bath operation includes Aeroheat 1000 and Aeroheat 1200 formulated for the treatment of medium carbon and high carbon steels without decarburization; Aeroheat 300 and Aeroheat 400 for tempering, low temperature annealing and isothermal quenching of steel, solution heat treatment of cast and wrought aluminum, and annealing and stress relieving of cast and wrought brasses; Aeroheat 920 for the secondary tempering and nitriding of high speed steel tools.
Also (in operation) a full size water demineralization unit, trade name Filt-R-Stil Lab Unit, and a laboratory model of a new coolant clarifier. The Filt-R-Stil Lab Unit, having a flow rate of 30 gal. per hr., produces demineralized water—water equal or superior to distilled water in solids content and electrical resistance—through the medium of ion-exchange resins.
A laboratory model of the coolant clarifier employing an entirely new principle far superior to filter units for clarification of water soluble or emulsifiable type coolants will be in operation. Periodic demonstrations of this machine will be made showing removal of substantially all solids from the coolant solutions.
In attendance: R. H. Landis, G. D. Johnston, P. E. Holder, A. B. Filicko, Ed. Edmunds, G. H. Bartow, C. Byron, W. E. Manring, M. C. Welker, C. J. Kirkland, J. J. Bean, O. J. DeLon, M. J. Wixson.

American Foundry Equipment Co., Mishawaka, Ind. Booth P-504.
Exhibiting (in operation): Equipment showing how shot peening increases the fatigue life of machine parts.
In attendance: O. A. Pfaff, president; L. L. Andrus, vice-president in charge of sales; A. E. Lenhard, advertising

SHOT ★ PEENING

★ WHEELAPEENING — Trade Name

A NEW TECHNIQUE FOR AN OLD PROCESS

"Shot peening" is used to describe the process of bombarding the surface of a metal structural or machine part with metallic shot to increase its fatigue life.

Doing so puts the surface layers in a state of residual compression which offsets the tension stress set up by bending or twisting the part, so that "fatigue cracks" do not get a chance to start.

Shot peening is being used today for such products as torsion bars, propeller shafts, axles, connecting rods, bearing housings, milling cutters, pneumatic drills, etc. Examples of increased fatigue life: Welded joints 310%, steering knuckles 475%; engine crankshafts 900%; helical springs 1370%; transmission main shafts 520%; hypoid gears 600%.

Shot peening is done commercially at low cost by American WHEELAPEENING machines, which we invite you to inspect at our Metal Show Booth No. P-504.

Mention R497 When Writing or Using Reader Service.

manager; D. C. Turnbull, chief engineer; T. Hutchinson, metallurgist; Harold Schulte, research engineer; Kenneth Barnes, sales engineer; V. S. Spears, sales engineer; and E. A. Rich, E. B. Rich, J. D. Alexander, R. L. Orth, A. H. Freeman, C. L. Benham, David Logan, Ferd G. Schultz, C. F. Ludwig, H. G. Mouat, F. W. Pedrotty, and Russell Duer, sales.

American Gas Furnace Co., Elizabeth, N. J. Booth B-103.
Exhibiting: One of American Gas Furnace Co.'s popular size rotary gas carburizing machines with several new features and improvements. Lantern slide projector with slides showing interesting equipment and installations. A wide variety of photographs and literature.

In attendance: P. C. Osterman, vice-president; T. Farwick, Sr., burner expert; John Mehrman, engineer; George A. F. Machlet, engineer; J. E. von Maur and Elmer C. Cook, Ohio representatives; W. J. Barenscheer, Chicago representative; S. C. Dinsmore, Detroit representative; O. T. Muehlemeyer, Rockford, Ill., representative.

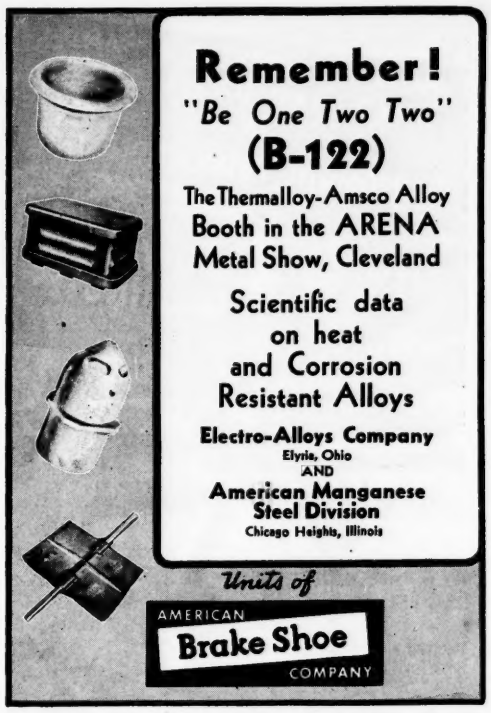
American Machine and Metals, Inc Booth A-424. (See **Riehle Testing Machine Division.**)

American Machinist and Product Engineering, New York City. Booth B-111.
Exhibiting: Magazines and literature.

In attendance: (For *American Machinist*): Burnham Finney, editor and publisher; W. E. Kennedy, general manager; N. B. Stanton, assistant manager; John Haydock, managing editor; Rupert LeGrand, associate editor; B. C. Brosheer, associate editor. (For *Product Engineering*): G. F. Nordenholt, editor; John Sasso, managing editor; R. E. Cleary, manager, research and promotion; G. V. Patrick, district manager.

American Manganese Steel Division of American Brake Shoe Co., Chicago Heights, Ill. Booth B-122.
Exhibiting: Technical information resulting from research in metallurgy and development in the process of making castings in the experimental foundry. Development of better castings. Radiographic films.

In attendance: W. G. Hoffman, manager, alloy department; E. A. Lerner, assistant manager, alloy department; W. C. George, metallurgical engineer; J. A. Brandenburg, representative; H. E. Johnson and H. S. Knight, engineers; E. Cook, chief metallurgist; R. H. Schaefer, assistant chief metallurgist; H. S. Avery, research metallurgist; H. B. Huntress and J. L. Goheen, metallurgists.



Mention R498 When Writing or Using Reader Service.

American Metal Market, New York City. Booth G-622.
Exhibiting: Specimen copies of *American Metal Market*, the pioneer daily newspaper of the iron, steel and metal industries, established in 1882 and published daily since 1899. Widely recognized as the market authority and for the past 44 years the daily newspaper of the trade furnishing the most thorough coverage of the important buyers of iron, steel and nonferrous metals and metal products. An effective advertising medium used by over 200 important sellers of ores, ferro-alloys, iron, steel and non-ferrous metals. Member of the Audit Bureau of Circulations.

In attendance: R. A. Langer, secretary and advertising manager; George Ehrnstrom, Jr., and P. D. Fahnestock, representatives.

American Photocopy Equipment Co., Chicago. Booth A-337.
Exhibiting (in operation): Continuous demonstration of A-PE-CO photocopy equipment, showing how speedily and accurately photo-exact duplicates, in any desired quantity, can be made from anything written, printed, drawn or photographed. Copies from originals, whether on one or two sides, and without removing pages from books. Used in thousands of plants for copying drawings, blueprints, letters, charts, technical articles, salesmen's material, testimonials, wiring diagrams.

In attendance: Arthur L. Creange, partner; Jos. S. Lederer, partner; C. A. Lederer, service engineer; and Wm. H. Cohen, Bert Harris, L. J. Cohen, and J. W. Lane, field engineers.

American Porcelain Enameling Co., Muskegon, Mich. Booth C-428.

American Type Founders, Inc., Elizabeth, N. J. Booth G-633.
Exhibiting (in operation): Two Spark Gap Induction Heating Units, capable of hardening, brazing, annealing, etc.

New

Induction Heating Equipment

Visit Booth G-633

Models in Operation

Bring us your problems in Hardening . . . Annealing . . . Stress Relieving . . . Brazing . . . Soldering . . . Melting.

American Type Founders, Inc.
Induction Heating Division
200 ELMORA AVENUE, ELIZABETH B, NEW JERSEY

Mention R499 When Writing or Using Reader Service.

In attendance: John C. Righter, Jr., division manager; Douglas Bennett, engineering; Arthur J. Rock, production control; Howard Hentz, sales; Mark Soubie, sales; Frank H. Plaisted, assistant division manager; G. H. Van Steenbergh, assistant division manager.

American Society for Metals, Cleveland. Booth S-116.
Exhibiting: Technical and market information on the Society and its publications, METAL PROGRESS, THE METALS REVIEW. Complete line of technical books for the metal industry. Historical dioramas.

In attendance: the Executive Committee of the Cleveland Chapter of the American Society for Metals, in charge of exhibit; W. H. Eisenman, national secretary; Ray T. Bayless, assistant secretary; E. E. Thum, editor, METAL PROGRESS; Carl Ohlson; Charles Ellicock; Chester L. Wells; A. P. Ford; M. R. Hyslop, managing editor, THE METALS REVIEW.

American Utilities Corp., Cleveland. Booth A-633.

Ampco Metal, Inc., Milwaukee. Booth D-130.
Exhibiting (in operation): Sand and centrifugal castings, finished machined parts, forgings and extruded bars of Ampco Metal and Ampcoloy. Other nonferrous alloys to Navy, Air Corps, A.M.S., and A.S.T.M. specifications. Safety tools of Ampco Metal and Ampco beryllium copper. Working demonstration of Ampco Trode coated aluminum bronze weld rod.

In attendance: Ray W. Uecker, secretary-treasurer; S. C. Lawson, manager, central division; Emil Svoboda, Cleveland district manager; J. K. Bybee, Detroit district manager; J. E. Cook, Cincinnati district manager; J. E. Heuser, Pittsburgh district manager; Roy Norton, manager, welding division; E. J. Sorenson, assistant manager, welding division; H. Hose, welding engineer; W. Claffman, sales engineer, welding division.

Anderson Oil Co., F. E., Portland, Conn. Booth A-420.
Exhibiting (in operation): Samples of products in bottles. Panels of steel coated with various rust preventives. Demonstration of water-displacing rust preventives. Various machined parts showing work done by our cutting and grinding oils. Demonstration of water emulsion cleaners for metal parts.

In attendance: F. E. Anderson, partner; A. W. Ackerman, chief chemist; H. E. Gallic, T. C. Bradford, and C. A. Sluhan, service engineers.

Ansco, a Division of General Aniline & Film Corp., Binghamton, N. Y. Booth C-203.

Armstrong Cork Co., Lancaster, Pa. Booth C-615.
Exhibiting: Armstrong's Insulating Fire Brick—five types for temperatures to 2600° F. Also Armstrong's Insulating Cements, Diatomaceous Earth, and Insulmastic. Display features actual furnace constructions by means of models. Flat arch, arch, and dome types —also suspended wall construction.

In attendance: B. W. Adams, H. C. Brown, Jr., S. M. Jenkins, F. W. Muller, J. G. Seanor, J. M. Smith.

Aro Equipment Corp., Bryan, Ohio. Booth I-624.
Exhibiting (in operation): Portable rotary pneumatic tools such as drills, grinders, screw drivers, nut setters, impact wrenches, sanders, accessories.

In attendance: R. W. Morrison, manager, industrial tool division; E. L. Jackson, sales division; C. P. Enston, field engineer; L. O. Barrett, field engineer; C. W. Ginter, factory manager; J. E. Allen, assistant to the president.

Automatic Temperature Control Co., Inc., Philadelphia. Booth P-513.
Exhibiting (in operation): New Electronic Input Controller for accurate regulation of power input to electric furnace heating elements.

New Impulse "Balancer" Relay for electronically controlling temperatures on a proportioning basis, featuring automatic reset and "second derivative".

New "Meterol" Fuel Oil Valves for flow control. Sixteen easily selected flow direction combinations with only one valve; one moving part; no pressure on stuffing-box when valve is shut off; four capacities.

New Type 1-AL Motorized Operator for large valves, capable of operating slip-stem type valves which require up to **one ton** operating force.

New Signaling Timer for protection of furnace work.

New Type 4 Motorized Operator for automatic regulation of valves, burners, dampers, etc.

New Manually-Set Input Controller for governing current to electric heating elements in furnaces, ovens, platens, etc.

Improved Time-Temperature Program Controller for stress-relief and annealing operations governing rate of heat, rate of cool and length of soaking time.

Standard ATC Line of Motorized Operators for control valves, burners and dampers.

Standard ATC Line of Time Controls for control of machines and industrial process operations. Many improvements and redesigns.

In attendance: W. L. Hunt, research director; G. H. Johanson, president; W. W. Winters, advertising manager; G. E. Gress, acting sales manager; G. S. Frazee, C. Adams, H. Palmer, H. W. Munday, R. R. Gannon, and S. Hager, representatives.

Automatic Transportation Co., Division of Yale & Towne Mfg. Co., Chicago. Booth A-409.
Exhibiting (in operation): Electric propelled materials handling equipment will include Automatic Transporter type motorized hand trucks with hydraulic lift and front wheel drive. Platform type for skids and fork type for pallets. The equipment is applicable to single lift and short hauling operations to and from storage, in and out of box cars or motor trucks and through process and can be used in combination with the larger center-control fork lift trucks with front wheel drive and power lift (applicable for long hauling and stacking). All three types exhibited.

In attendance: Chicago office—E. F. Twyman, general manager; R. L. Wolter, sales manager; E. L. Bertram, manager sales promotion; J. M. Johnson, assistant sales manager, Transporter division; R. M. Whitney, assistant sales manager, truck division; L. R. Lindsley, sales representative; P. W. Voss, sales representative. Milwaukee office—O. E. Rosche, sales representative. Cleveland office—B. I. Florey, sales representative. Buffalo office—N. L. Gorman, sales representative. Detroit office—J. A. Gordon, sales representative. Cincinnati office—Batsner Brothers, sales representatives. Pittsburgh office—L. N. Crissman, sales representative. New York office—R. L. Smith Associates, eastern general sales agents.

Exhibitors—

Automotive and Aviation Industries, Philadelphia. Booth G-623.
Exhibiting: Automotive publications and services.
In attendance: Jos. S. Hildreth, vice-president and manager automotive division; Julian Chase, directing editor automotive division; Jos. Geschelin, Detroit technical editor; Harland E. Boyd, sales representative; John C. Hildreth, sales representative.

Babcock & Wilcox Co., Refractories Division, New York City. Booth C-133.
Exhibiting (in operation): The relationship between B & W refractories and the war shown by means of photographs and two Selectroslide machines which change slides automatically. Typical products used in the war which either contain B & W refractories or were manufactured with the aid of equipment employing B & W refractories, will be pictured, including a battleship, a destroyer, a tank, a machine gun, a flying fortress, etc. A model furnace, showing methods of supporting insulating firebrick.
In attendance: A. M. Kohler, general manager; J. E. Brinckerhoff, sales manager; Carl Claus, Jr., superintendent of Augusta Works; *C. M. Neighbors, advertising* manager; M. J. Costello, N. Y. district sales manager; G. M. Frederick, Philadelphia district sales manager; M. J. Terman, Pittsburgh district sales manager; J. L. Allison, Jr., Chicago district sales manager; F. B. Cornell, agent in Detroit; W. A. Stuart, Cleveland district sales manager; Donald Laing, Boston district sales manager; E. R. Jefferson, agent in Syracuse; J. O. Archibald, agent in Buffalo; R. M. Onan, agent in Milwaukee.

Bailey Meter Co., Cleveland. Booth I-640.
Exhibiting (in operation): Electronic type instruments for indicating, recording and controlling; temperature, flow, level, pressure, motion and other factors. Oxygen-Combustibles recorder-controller for measuring and controlling furnace atmospheres and flue gases.
In attendance: H. M. Hammond, manager of sales and engineering; C. C. McClelland, manager Cleveland sales office; P. S. Dickey, research engineer; J. F. Luhrs, mechanical engineer; E. B. Bossart, mechanical engineer.

Baker & Co., Inc., Newark, N. J. Booth A-421.
Exhibiting (in operation): Two furnaces complete with pyrometers for general heat treating purposes and one high speed steel furnace. All furnaces operate without compressed air or blowers. One standard Baker No. 12 hydrogen furnace for annealing and brazing. One Baker-Brunjes electric platinum-rhodium muffle wound coal ash analysis furnace with Charles Engelhard, Inc., W-1 temperature indicator.
In attendance: Nicholas Schilling, in charge of furnace division.

Baldwin Southwark Division, The Baldwin Locomotive Works, Philadelphia. Booth B-605.
Exhibiting (in operation): A complete new line of fatigue testing equipment. This includes three new universal fatigue testing machines, a high capacity rotating beam fatigue machine and a small flexure fatigue testing machine for sheets. Also SR-4 strain gage products and accessories, including the latest developments of our electronic laboratory. A new price universal testing machine with a pendulum load indicator, will be introduced.
In attendance: F. G. Tatnall; W. H. Harman, Jr.; C. H. Gibbons; F. Buckingham; J. H. Gaul; H. J. Thomsen; C. L. Mattsson; A. Sonntag.

Barrett-Cravens Co., Chicago. Booth C-633.
Exhibiting (in operation): Lift-trucks, hand and electrically operated; lift-truck skid; portable elevator; two-wheel trucks.
In attendance: A. M. Barrett, president; E. J. Heimer, vice-president; O. L. Jenkins, district sales manager; H. C. Morrison, sales engineer; James Morrison, sales engineer.

Bastian-Blessing Co., Chicago. Booth P-512.
Exhibiting: Oxy-acetylene welding and cutting apparatus. High pressure gas manifold and control equipment. Liquefied petroleum gas control equipment. Rego Karweit driller. Various war products.
In attendance: Ellsworth L. Mills, vice-president; R. E. Poethig, sales manager; H. A. Goodwin, district manager; J. W. Green, manager L. P. gas division; Frank Fisher, welding and cutting division manager.

Bausch & Lomb Optical Company, Rochester, N. Y. Booth C-607.
Exhibiting (in operation): Scientific instruments including metallographic and spectrographic equipment, contour projector, toolmaker's microscope, laboratory and inspection microscopes.
In attendance: I. L. Nixon, sales manager, scientific instrument division; M. H. Stevens, assistant sales manager in charge of industrial sales; C. C. Nitchie, sales engineer; E. G. Koch, sales engineer; P. M. Stoehr, sales engineer; J. H. Mead, Chicago district sales engineer; L. B. McKinley, Cleveland-Pittsburgh district sales engineer; H. L. Shippy, Detroit district sales engineer.

Bell & Gossett Co., Morton Grove, Ill. Booth D-618.
Exhibiting (in partial operation): Quench systems for use in heat treating; heat transfer equipment; pumps; quench tanks.
In attendance: E. J. Gossett, president; W. P. Gossett, manager industrial division; W. A. Boone, A. W. Arnold, and L. L. Arbuckle, industrial division; E. L. Malm, sales promotion.

Bellis Heat Treating Co., Branford, Conn. Booth H-604.

Bellows Co., Akron, Ohio. Booth D-311.
Exhibiting (in operation): Complete line of controlled air power devices for speeding production in machine tool operations. These devices include: The Bellows Air Motor, with integral valve and operating controls; the Bellows Air Feed, with hydraulic checking devices and different types of electronic time controls; the Bellows Electroaire Power Feed Unit, for feeding small wire drills or taps, powered by air and solenoid control; the Bellows Automatic Vise and Heavy Duty Milling Machine Vise, which develops clamping pressures up to as high as 40,000 lb.; the Bellows-Wayne Air Collet.
In attendance: L. F. R. Bellows, president; H. B. Link, vice-president and general manager; W. E. Pettersen, chief engineer; J. H. Barry, sales manager; Lloyd Bowman, B. A. Kaatz, H. S. Cadieux, Carl Heinzelman, Ray Worthington, and R. Brewer, field engineers.

A BELLOWS Controlled Air-Power Drill Press Feed, synchronized with a Bellows Controlled Air-Power Vise, brings automatic operation to standard drill presses in a matter of minutes.

Automatic action speeds production, reduces worker fatigue, lessens shop accident hazards — means more uniform quantity and quality of production.

See it IN ACTION Booth D-311 National Metal Show

All types of hand-operated machine tools: drill presses, lathes, milling machines, grinders—can be quickly made into automatic units by the addition of inexpensive Bellows Controlled Air-Power Devices: Air Motors, Machine Feeds, Air Vises and Collets. The improvement can be made in your own plant, by your own tool engineers.

If you can't visit our booth D-311 at the National Metal Congress, write for our new, free Photo-Facts File—25 full sized photographs of typical Bellows installations in plants all over America, complete with production facts and installation costs.

The Bellows Co.
861 E. TALLMADGE AVENUE
AKRON 10, OHIO

Mention R500 When Writing or Using Reader Service.

Bison Forge Co., Inc., Buffalo. Booth F-606.
Exhibiting: Hammered forgings such as weldless rings, crankshafts, spindles, upset forgings, large nuts, crane hooks, die blocks, clevises. Hammered forgings of steel, aluminum, magnesium, copper and brass.
In attendance: William M. George, plant manager; Ralph R. Casper, plant superintendent; David L. George, president.

Black Drill Co., Cleveland. Booth D-146.
Exhibiting (in operation): Three drill presses, using "Hardsteel" drills for drilling, counterboring, countersinking and reaming hardened steel. These operations will be performed on fully hardened steel files. Visitors are invited to take in their own samples of hardened steel for Hardsteel drilling.
In attendance: F. G. Gepfert, president; H. F. Longnecker, chief engineer; J. A. Remekes, assistant chief engineer; C. E. Diebold, superintendent; W. J. Moore, H. J. Beck, R. B. Hogue, and W. E. Dougherty, sales engineers; C. F. Barton, Detroit representative; A. O. Muenz, New York representative; W. S. Leech, advertising manager.

Bradley Washfountain Co., Milwaukee, Wis. Booth C-625.
Exhibiting (in operation): One 5-in-a-group multi-stall shower; one 54-in. circular washfountain (operating); one 36-in. circular washfountain; one drinking fountain.
In attendance: Chas. H. Berenger, advertising manager; and Arthur S. Fielding, Howard Wales, and C. D. Herman, Cleveland representatives.

Brickseal Refractory Co., Hoboken, N. J. Booth F-611.
Exhibiting: Protective coating for refractories in boiler and industrial furnaces, designed to prolong life and increase efficiency of these units for temperatures ranging up to above 3000° F. Treatment for sludge formation in fuel oil storage tanks.
In attendance: J. F. Govan, president; R. H. Govan, treasurer; J. L. Hankinson, Great Lakes district sales manager; H. P. Rice, Chicago representative.

Bridgeport Brass Co., Bridgeport, Conn. Booth A-315.

Briggs Manufacturing Co., Cleveland. Booth D-640.
Exhibiting: Samples placed on standards. Also four tables containing samples, flasks and molds. Similar to exhibit at A. F. A. convention in Buffalo.
In attendance: C. H. Kuschel, plant manager; D. K. Moore, assistant manager and sales manager; N. B. Barnard, sales engineer; A. F. Faber, Jr., product engineer; V. C. Stocker, superintendent; J. R. Vance, cost-estimating; P. J. Meifert, purchasing agent; K. Phillips, chief draftsman; M. C. Barr; A. J. Gatt, material control; W. S. Becker, production scheduling; W. J. Driesbaugh, maintenance; T. Force, personnel; A. Hunter.

Bristol Co., Waterbury, Conn. Booth B-614.
Exhibiting (in operation): Bristol-Rockwell dilatometer, Model A-134, which records temperature-dilation changes and temperature-time changes simultaneously in ink during heating and cooling cycles of ferrous metals. Samples of various kinds of steel will be tested during the exhibit.
Bristol Pyromaster Pyrometers: Several models of the Pyromaster Potentiometer Pyrometer, including recording, indicating, and automatic controlling models for use with thermocouples and radiation units. *A time-temperature Pyromaster Controller will be operating.*
Model E486 Bristol Electronic Pyrometer Controller as well as the Model E40M Electronic Thermometer Controller for control of oven temperatures, oil tempering baths, and cyanide pots.
Bristol Air-Operated Free-Vane Controllers: Several models of air-operated temperature controllers.
In attendance: R. Hazard, executive vice-president; L. G. Bean, vice-president in charge of engineering and sales; H. E. Beane, sales manager; G. P. Lonergan, manager, sales promotion department; G. H. Gaites, regional manager, Cleveland; C. Worth, resident sales engineer, Cleveland; J. E. Booth, sales engineer, Chicago; A. M. Crawford, sales engineer, Pittsburgh.

Brown Instrument Co. Division of Minneapolis-Honeywell Regulator Co., Philadelphia. Booth F-601.
Exhibiting (in operation): The Brown ElectroniK Potentiometer. A preview of potentiometer pyrometers that Brown will furnish in the postwar period. The new commercial Strip Chart Recording ElectroniK Potentiometers, in addition to models of the Circular Chart Indicating and Recording ElectroniK Potentiometers which have become prominent in the metals industry in the past several years.
In attendance: L. Morton Morley, vice-president and general sales manager; K. R. Knoblauch, assistant general sales manager; W. H. Steinkamp, assistant general sales manager; W. R. Moore, Cleveland zone manager; J. R. Green, manager of steel division; R. R. West, manager of furnace division; and A. J. McCullough, J. E. MacConville, J. N. Redpath, and H. D. Ruch, instrumentation engineers.

Brush Development Co., Cleveland. Booth E-619.
Exhibiting (in operation): Use and function of the Brush Surface Analyzer, an instrument that records in millionths of an inch the surface smoothness of metals, glass, plastics, paper, plated or painted surfaces. Large scale display panel. The Brush Direct Inking Oscillograph, both single and double pen units, and Brush vibration and pressure pickups. This instrument operates on 110-volt, 60-cycle alternating current, making graphic recordings of mechanical or electrical conditions as indicated by the appropriate pickup.
In attendance: Blair Foulds, commercial engineering manager; Jesse Johnson, sales manager; Carl Novorska, field service engineer; Neuman Fayerweather, sales engineer; Harry Shaper, engineer; Robert Matheson, sales engineer; James Brickenden, sales engineer; John Bodnar, sales engineer; William Shelton, advertising manager.

Budd Induction Heating, Inc., Detroit. Booth D-320.
Exhibiting: Induction heat treating.
In attendance: H. E. Somes, Sr., chief engineer; H. O. Mainzinger, manager of sales; David Davenport, Budd Wheel Co.; A. H. Ehle, Edw. G. Budd Mfg. Co.

Buehler Ltd., Chicago. Booth E-133.
Exhibiting (in operation): New 1 h.p. cut-off machine for metal working laboratories featured with complete line of sample preparation equipment.
In attendance: Adolph I. Buehler, general partner; George W. Graves, sales manager.

Burdett Manufacturing Co., Chicago. Booth D-601.
Exhibiting (in operation): A 15-ft. conveyor type paint drying oven demonstrating a one-minute drying cycle operation using Burdett Infra-Red Gas Burners. A revolving wheel with operating burners will be used to demonstrate the versatile positions possible with the burners. A continuous water demonstration will also be used.
In attendance: J. E. Veihl, secretary and treasurer; W. H. Tesmer, chief engineer; T. P. Tesmer, Chicago engineer; E. H. Perkins, St. Louis engineer; D. C. Scheele, Wisconsin engineer; T. J. Ryan, Cincinnati engineer; D. A. Jacobson, Michigan engineer.

By-Products Steel Corp. Booth B-110. (See **Lukens Steel Co.**)

Campbell Division, Andrew C. American Chain & Cable Co., Inc., Bridgeport, Conn. Booth D-321.
Exhibiting (in operation): Actual cutting of various metals including annealed and non-annealed steel and non-ferrous alloys in solid bar, tubular and flat stock, on Campbell No. 213 abrasive cutting machine with hydraulic and oscillating attachment, as well as on No. 401 Cutamatic and No. 302 Campbell horizontal wet abrasive cutting machine. The No. 250 Campbell nibbling machine will be demonstrated.
In attendance: R. J. Southwell, sales manager; H. G. Robinson, chief engineer.

Canadian Radium & Uranium Corp., New York City. Booth G-628.
Exhibiting: Equipment used in taking radiographs with radium. Viewing box to examine developed films of radium radiographs. Samples of dials, pointers, panels, knobs, etc., that have been treated with radium luminous compounds for night vision.
In attendance: Joseph S. Harris, technician; Daniel S Bobrow, sales department.

Carboloy Company, Inc., Detroit. Booth E-604.
Exhibiting: Products made not by the Carboloy Co. but by independent tool agents of the Carboloy Co. to whom Carboloy supplies metal in the form of tips. Largely a wide variety of special tools and cutters manufactured by these companies. Also complete

line of Carboloy standard tools, tips, etc. Series of training films on design, care and use of carbides.
In attendance: K. R. Beardslee, vice-president in charge of sales; J. R. Longwell, director of research and engineering; Harry Crump, assistant to the vice-president in charge of sales; E. C. Howell, advertising manager.

Carpenter Steel Co., Reading, Pa. Booth D-102.
Exhibiting (in operation): Actual demonstration of a method for quickly checking the identity of stainless steel. A series of tests carefully charted by Carpenter metallurgists will demonstrate this method, so useful when stainless steels become mixed in stocks.
War and peacetime applications on which Carpenter steels have met high performance requirements. Steps taken in making Carpenter steels to meet top performance requirements will be shown, along with specimens of tests that help to predetermine hardening behavior, fabricating qualities and service life. Of exceptional interest to men interested in postwar product development will be Carpenter high nickel alloys and the examples of specific uses of these "engineered metals". How invar has been made readily machinable by Carpenter will be demonstrated by examples of the new Carpenter Free-Cutting Invar "36", produced under Carpenter patents.
In attendance: J. H. Parker, president; Frank B. Palmer, vice-president; B. H. DeLong, chief metallurgist; G. V. Luerssen, metallurgist; P. B. Greenawald, metallurgical engineer; C. B. Post, metallurgist; and W. H. Kemper, S. M. Heck, George Brumbach, Walter Schlegel, Harold Miller, and M. C. Fetzer, metallurgical department; R. V. Mann, general sales manager; O. V. Greene, manager tool and alloy steel sales; W. M. Loos, sales department; H. S. Potter, assistant manager tool steel sales; J. W. Thompson, assistant manager alloy steel sales; E. Von Hambach, research and development engineer; H. C. Dicome, tool engineer; A. E. Keller, advertising manager; J. S. Bailey, Jr., district manager; V. W. Gardner, W. O. Lahde, H. R. Potter, W. J. Randall, H. G. Roodhuyzen, W. R. Watt.

Central Scientific Co., Chicago. Booth P-523.
Exhibiting (in operation): Complete line of Cenco high vacuum pumps, constant temperature laboratory ovens, rapid method Leco carbon and sulphur determinators, Cenco "Photelometers" for fast colorimetric analyses, and other outstanding developments in laboratory apparatus and instruments.
In attendance: W. G. Campbell, V. F. Duensing, C. E. Widick, W. L. Long, and G. C. Godejahn, technical representatives; Harris M. Sullivan, assistant director of research; C. S. Hornberger, development engineer.

Chemical Rubber Co., Cleveland. Booth A-310.
Exhibiting: Many new items of laboratory apparatus and equipment which will be of interest to chemists, metallurgists and technicians engaged in tensile and metallographic testing.
In attendance: O. A. Behrend, sales manager; L. J. Muzslay, assistant sales manager; W. R. Bock, sales engineer; F. C. Hays, sales engineer.

Cherry Rivet Co., Los Angeles. Booth C-242.
Exhibiting (in operation): Cut-away models of Cherry rivet applications. Projectors for demonstration purposes.
In attendance: Arthur H. Baier, Ohio representative; E. H. Stau, chief service engineer.

Chicago Flexible Shaft Co., Chicago. Booth A-410.
Exhibiting (in operation): Moving display of various types of Stewart Industrial Furnaces illustrated by typical installations. The pictures are in colors and are automatically projected on a screen in the forepart of the booth.
In attendance: J. H. Mills, manager, furnace division.

Chicago Steel Foundry Co., Chicago. Booth L-102.
Exhibiting (in operation): Heat resisting, miscellaneous equipment.
In attendance: David Evans, president; N. A. Weston, general manager; C. K. Garrison, engineer; Frank Ludera.

Cities Service Oil Companies, New York and Chicago. Booth F-629.
Exhibiting: Cities Service petroleum products and the Cities Service Industrial Heat Prover—an instrument for determining the percent of oxygen and combustibles in furnace gases.
In attendance: B. B. Mears, H. F. Jones, D. L. Williams, R. G. Dix, H. J. Sumpter, E. E. Puls, F. Wirth.

Clark Equipment Co. Booth C-221. (See **Clark Tructractor Division**)

Clark Instrument, Inc., Dearborn, Mich. Booth C-233.
Exhibiting (in operation): Clark Hardness Tester for "Rockwell Testing" of hard and soft steel, brass, aluminum, cast iron, copper, other metals and alloys. Clarkator for the checking of all indicators especially those on comparators, hardness testers and any other instrument using dial indicators.
In attendance: C. W. Clark and E. H. Herman, representatives.

Clark Tructractor Division of Clark Equipment Co., Battle Creek, Mich. Booth C-221.
Exhibiting (in operation): One Clark Carloader 4000-lb. capacity storage battery fork truck. One Clark Clipper 2000-lb. capacity gasoline operated fork truck.
In attendance: E. W. Clark, vice-president and general manager; Ray E. Madden and James Conklin, sales managers; C. I. Ucker, L. E. Hoag, and G. R. Case, district engineers.

A View Down One of the Aisles in the Underground Level During a Previous Exposition.

Clark Co., Robert H., Beverly Hills, Calif. Booth K-617.
Exhibiting (in operation): Complete line of adjustable cutting tools including the Clark 3-blade adjustable hole cutters, 9 sizes; Clark 3-blade adjustable face milling cutters, 4 sizes; Clark 2-blade adjustable flycutters, 2 sizes; Clark 2-blade adjustable gasket cutters, 2 sizes; Clark 2-blade adjustable counterbore and spot facers, 9 sizes; Clark adjustable thread tool grinding fixtures, 3 sizes; and the new Clark adjustable tool holder which will receive its initial introduction at this show.
In attendance: Robert H. Clark; Don L. Lenzi, manager of tool division; W. C. Robinson and W. P. Hemenway, field engineers.

Only the Clark Lathe Tool Holder has all these Exclusive Features.

1. Each Holder accommodates four or more sizes of square or round tool bits.
2. Vise grip jaw rigidly clamps short tool bits.
3. Dual or narrow tool bits are firmly held for cutting-off or special forming operations.
4. Solidly grips and supports carbide bits and boring bars.
5. Vise grip holds bits of brittle alloys more securely without breakage.
6. Tilted position of screw and head provides unobstructed view of work.

Adjustable Vise Grip jaw gives full bearing for tool bits and even distribution of pressure.

Each Clark Tool Holder will grip not one but four sizes of tool bits. Complete range of shank sizes with 15° cutter channel; also parallel type for Carbide cutters and boring bars, right and left hand offset.

The complete line of Clark's Adjustable Cutting Tools, Tool Holders, Boring Bars and Grinding Fixtures will be on display at the National Metal Congress, Cleveland, Ohio, October 16th through 20th. Remember Booth K-617. Look for the big Clark Hole Cutter. See you in Cleveland.

See Your Jobber Now! Or Write For Bulletin

Robert H. Clark Company
9330 Santa Monica Boulevard Beverly Hills, California

Mention R501 When Writing or Using Reader Service.

Cleveland Chamber of Commerce. Booth G-640.
Exhibiting: Photographic and descriptive material concerning the industrial center of Northern Ohio.
In attendance: Walter I. Beam, executive vice-president; Clifford Gildersleeve, industrial commissioner; Carl E. Stahley, director of public relations; J. W. Vanden Bosch, manager, department of business information and statistics; Joseph M. Schultz, manager, construction industries department.

Cleveland Duplex Machinery Co., Cleveland. Booth B-215.

Cleveland Pneumatic Tool Co., Cleveland. Booth G-620.

Cleveland Tapping Machine Co., Cleveland. Booth B-603.
Exhibiting (in operation): Two tapping machines in operation on production job. Display.
In attendance: Mark Graves, manager; Ray A. Hughes, sales engineer; C. Newmaier, engineer; B. A. Taylor, sales representative; L. G. Beutel, secretary; S. Tapasso, maintenance; Frank Hellriegel, Bill Daniels, Earl Haurin, and C. O. Mandabach, demonstrators.

Climax Molybdenum Co., New York City. Booth D-425.
Exhibiting: Reception space.
In attendance: C. M. Loeb, Jr., vice-president; R. S. Archer; A. Linz, vice-president; T. D. Parker; D. G. Carse; A. J. Herzig, vice-president; V. A. Crosby; R. M. Parke; H. E. Hostetter; W. G. Patton; G. A. Timmons; F. Benz; E. Gramling; J. F. Robb; T. E. Norman; J. E. Wilson; E. R. Young; A. K. West.

. . . *Who Will Be in Attendance What They Will Exhibit* . . . .

Coffing Hoist Co., Danville, Ill. Booth C-424.
Exhibiting (in partial operation): "Safety-Pull Ratchet Lever Hoists to hang on our display rack.
"Quik-Lift" Electric Hoist, to be plugged into 3-phase, 220-volt, 60-cycles, to be operated as required.
Model Y-C Spur Geared Chain Hoist.
Coffing Load Binder.
I-Beam Trolley.
In attendance: Mike Crowder, district sales manager.

Commerce Pattern Foundry & Machine Co. Booth I-625. (See **Upton Electric Furnace Division**)

Conover-Mast Corp., New York City. Booth D-629.
Exhibiting: Publications.
In attendance: Harvey Conover, president; B. P. Mast, vice-president; E. M. Stanley, business manager; A. M. Morse, business manager; Lloyd Willoughby, western manager; *Stanley J. Smith, western manager;* Richard Grove, Cleveland manager; Robert Farson, Cleveland representative.

Continental Industrial Engineers, Chicago. Booth D-424.
Exhibition (in operation): A variety of installations of industrial heat treating furnaces and complete plants as installed by C.I.E. Literature on all types of installations both domestic and foreign.
In attendance: W. A. Darrah, president; E. B. Jones, vice-president; R. A. Hastings, vice-president; C. P. Masure, director of purchases; D. O'Connor, chief estimator.

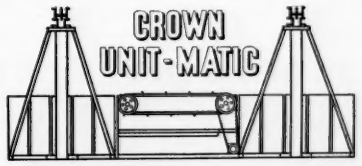
Continental Machines, Inc., Minneapolis. Booths B-314 and B-320. (See also DoAll Co.)
Exhibiting (in operation): DoAll precision gages and instruments with mobile inspection units; DoAll precision surface grinder; DoAll Zephyr high speed sawing machine; DoAll continuous bandfiler. Demonstration of precision grinding, "friction cutting," and bandfiling.
In attendance: Representatives from 12 district service offices located in the central and eastern sections of the United States, and factory engineers.

Crown Rheostat & Supply Co., Chicago. Booth C-428.
Exhibiting (in operation): Model of full automatic plating unit.
In attendance: G. E. Huenerfauth, president; F. P. Green, C. E. Clindinin, and G. J. Yochim, sales.

SEE THE

WORKING MODEL

OF THE



NAT'L METAL CONGRESS OCT. 16-20

FOR
PLATING
ANODIZING
PICKLING
DESCALING

Crown Rheostat & Supply Co., Chicago, Ill.

Mention R502 When Writing or Using Reader Service.

Crozier Machine Tool Co., Hawthorne, Calif. Booth K-611.
Exhibiting (in operation): One speed lathe, vacuum type; two speed lathes, collet types; one speed lathe, chuck type; one special combination drill press and riveting machine; "C-W-C" precision collets for engine lathes; turret tool posts; collet closing attachments; post-war (patented) anti-detonator for ignition combustion engines.
In attendance: H. E. Crozier, general manager; G. H. Vanderpoel, plant superintendent.

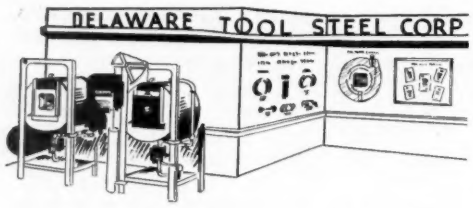
Darwin & Milner, Inc., Cleveland. Booth A-429.
Exhibiting: Dies and sample laminations. Photographs and descriptive literature.
In attendance: Frank W. Ladky, president; Stanley Wygonik, vice-president; Charles H. Kenlan and Sam Boyer, tool steel engineers.

Dearborn Chemical Co., Chicago. Booth I-632.
Exhibiting No-Ox-Id rust preventives; No-Ox-Idized laminated wrappers; Dearborn feed water treatment.
In attendance: E. M. Converse, vice-president; E. P. Fager, assistant vice-president; C. A. Remsen, assistant vice-president; J. A. Crenner, manager Pittsburgh office; Ted Kennedy, manager Detroit office; A. C. Moeller, manager St. Louis office; D. C. McKean, chemical engineer; J. G. Svrchek, chemical engineer.

Exhibitors—

Deepfreeze Division. Booth A-402. (See **Motor Products Corp.**)

Delaware Tool Steel Corp., Wilmington, Del. Booth A-325.
Exhibiting (in operation): Two Model B Delaware Controlled Atmosphere Furnaces, one with muffle removed to demonstrate tangential firing principles; also a display of tool products.
In attendance: Sylvan N. Levy, president; Sylvan N. Levy, Jr., vice-president; William B. Levy, vice-president; Fred S. George, installation engineer; Gus. L. Kronfeld, representative.



At Booth A-325 we will be waiting to show you our DELAWARE CONTROLLED ATMOSPHERE FURNACES. You are cordially invited to stop in for a demonstration of the latest developments in heat treating equipment.

If you won't be able to get to the Metals Show this year, the next best thing is to write us for literature describing our furnaces.

DELAWARE TOOL STEEL CORPORATION
Wilmington, Delaware
Mention R503 When Writing or Using Reader Service.

Dempsey Industrial Furnace Corp., Springfield, Mass. Booth E-613.
Exhibiting: Photographs and drawings of oil, gas and electrically heated industrial furnace equipment and samples of materials treated therein. Emersed electrode high speed salt bath furnace as used for treating high speed tools.
In attendance: H. B. Dempsey, president; M. K. Epstein, treasurer; R. R. LaPelle, manager special furnace division; H. L. Gilbert, special representative.

AT THE METALS SHOW...BOOTH E613

Investigate-

DEMPSEY
ENGINEERING SERVICE

Many new and improved Heat Treating methods have been developed as a result of the gigantic task of producing for war. The knowledge of these methods is at your disposal *now* for either your present or future needs. Write, wire or phone today for the Dempsey "Engineering Survey Sheet" . . . a questionnaire of needs which will put you in line for modern heat treating equipment . . . or see us at the Metals Show, Booth E613.

The Dempsey staff of Heat Treating Engineers are highly trained specialists who can serve your immediate needs or assist you NOW in drafting concrete plans for just the type of heat treating equipment you will want for most efficient peace time production.

DEMPSEY FURNACES
Mention R504 When Writing or Using Reader Service.

De Sanno & Son, Inc., A. P., Phoenixville, Pa. Booth B-135.
Exhibiting: Pre-fabricated moving picture theatre in which will be given daily showings of a new sound film "Speed in Cutting," describing complete line of abrasive cut-off machines and discs. Also display of grinding wheels, mounted points, and literature.
In attendance: C. H. Davis, vice-president in charge of sales; N. A. J. Conway, Jr., advertising manager; B. G. Hardy, manager machine sales division; Vincent Colagezzi, engineer; H. E. Carley, sales representative; C. J. Christensen, sales representative.

Despatch Oven Co., Minneapolis. Booth C-326.

Detroit Stamping Co., Detroit. Booth B-420.
Exhibiting: "DeStaCo" Toggle Clamps—clamping device for holding parts in jigs and while welding, drilling, reaming, assembly. "DeStaCo" Arbor Spacers—used for accurate spacing of milling cutters, saws, slitters. "DeStaCo" Blower Housings—standard line of die formed housings. Stampings—a selected group of interesting parts.
In attendance: G. H. Roberts, president; G. M. Trudeau, assistant manager; H. C. Robeson, engineer; J. T. Spencer, superintendent.

Building JIGS or FIXTURES?
Then you'll need some of those quick acting, positive holding, De-Sta-Co Toggle Clamps . . . Bulletin No. 43 will help you select the clamps best suited to your job. Send for it.
211 Latch CLAMP
470 Portable CLAMP
480 Toggle "C" CLAMP
202-A Weight 3 oz.
110-C Heavy 12" HIGH
205 Horizontal TYPE
DETROIT STAMPING CO.
Established Over 25 Years
378 Midland Ave • Detroit 3, Mich.
Mention R505 When Writing or Using Reader Service.

Detroit Surfacing Machine Co. Booth A-620. (See **H & H Research Co.**)

DeWalt Products Corp., Lancaster, Pa. Booth B-310.
Exhibiting: Tube cutting machine, foundry machine, high speed dry abrasive cutting machine, heavy duty wet abrasive cutting machine.
In attendance: Walter O. Gardner, product service and sales engineer; Charles W. Snyder, product service and sales engineer; Ewald Schutz, chief engineer.

Diamond Tool Co., Los Angeles. Booth C-208.
Exhibiting (in operation): One 2-h.p. Model M-24T milling machine; one 1½-h.p. Model M-24T milling machine; one 1½-h.p. Model M-24P milling machine; one 1-h.p. Model M-20T milling machine; two ¾-h.p. Model B-12 bench type milling machines. Complete accessories for above.
In attendance: J. K. Sutherland, sales manager; Stanley Swiatek, general manager.

Die Casting (Industrial Publishing Co.), Cleveland. Booth F-630.
Exhibiting: Typical die castings from many branches of industry and information on design and finishing factors involved.
In attendance: Irving B. Hexter, president and publisher; Lester P. Aurbach, vice-president and general manager; Jerome R. Peskin, associate editor; H. Smith, associate editor; Norman Lott, mid-west sales representative; L. Rees, mid-central sales representative; B. Pomeroy, special services.

Dietert, Harry W., Detroit. Booth D-110.
Exhibiting (in operation): A complete line of spectrographic equipment consisting of spectrograph, densitometer, excitation units, sampling equipment and accessories; two-minute carbon determinator; three-minute sulphur determinator; combustion furnaces; sand testing equipment.
In attendance: Harry Dietert, president; John Schuch, chief spectrographer; Robert Doelman, assistant foundry consultant; Alan Goldblatt, William Martin, and Bob White, spectrographers.

Dillon & Co., Inc., W. C., Chicago. Booth C-629.
Exhibiting: Dillon Model K Tensile Tester, Dillon Model AN Dynamometer (Traction), Dillon Temperometer, Dillon Dyna Coupler.
In attendance: W. C. Dillon, president; Edwin Dillon, vice-president; Robert Dillon, sales manager; Ralph Dillon, chief engineer.

Diversey Corp., Chicago. Booth A-624.
Exhibiting (in operation): Metal cleaning and metal working compounds, including lubricants, coolants, alkaline and emulsion cleaners. Special chemical processes developed for the metal working industries. Examples of typical results.
In attendance: H. W. Kochs, chairman of board; L. Shere, president; W. M. Allison, manager metal industries department; B. B. Button, assistant to manager; J. D. Malone, sales manager; and H. G. Grabill, L. C. Hesoun, A. L. Johnson, V. G. Michaels, C. D. McConkey, J. B. Monaghan, S. T. Schulman, A. D. Scobie, R. L. Shannon, L. M. Wokosin, W. H. McKeever, W. G. Yokel, service engineers.

Divine Brothers Co., Utica, N. Y. Booth F-633.
Exhibiting (in operation): Polishing and buffing of customers' samples on a Divine Low Lathe, using Divine polishing wheels and buffs; recommendations for processing customers' parts. A Divine cabinet-type Thermo-Electric glue heater, No. 3 Wheel Header, wheels and buffs, as well as those of the Yerges Manufacturing Co. Use of the Divine Compress Polishing wheel for polishing contoured pieces.
In attendance: A. M. Brown, machinery sales; G. A. Callanen, product engineer; W. M. Peterson, product consultant.

DoAll Cleveland Co., Cleveland. Booth B-320.
Exhibiting (in operation): DoAll contour sawing and filing machine; DoAll hydraulic surface grinder; DoAll saw band butt welder; DoAll cutting oils; DoAll steel ink; DoAll grinding wheels; DoAll gage instruments; DoAll gage blocks; Speedmaster variable speed pulleys; DoAll filing machine.
In attendance: Lloyd D. Kling, president; Clarence T. Kling, Jack M. Beggs, George D. Olson, and Arthur B. Erickson, sales and service.

DoAll Co., Des Plaines, Ill. Booth C-315. (See also Continental Machines, Inc.)
Exhibiting: DoAll saw bands, file bands, abrasive bands, grinding wheels, cutting oils and lubricants. Recommendation data.
In attendance: Representatives from 12 district service offices located in the central and eastern sections of the United States, and factory engineers.

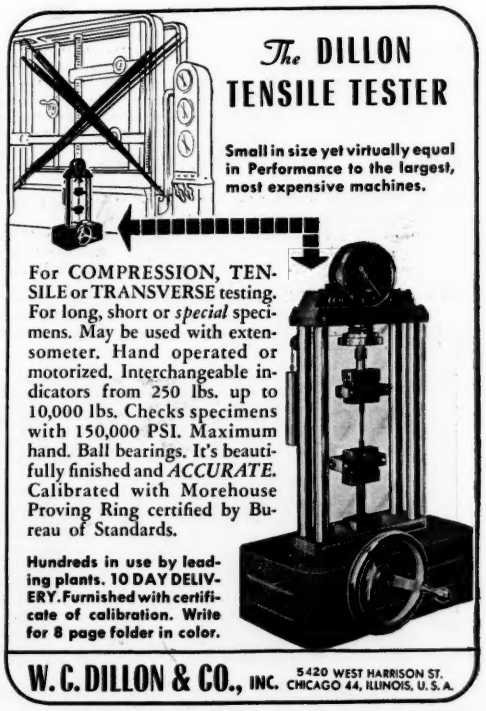
Dow Chemical Co., Midland, Mich. Booths B-311 and B-315.
Exhibiting (in operation): Three-section display developed around theme of "Magnesium—The Metal of Motion." These divisions center around the many post-war applications of Dowmetal; demonstrations of the metal's lightness and strength; and methods of fabricating Dowmetal. One unit will show the method and ease of drawing magnesium sheet, another the machining of Dowmetal, and the third demonstration will feature Dow's magnesium "Daily Double."
In attendance: L. B. Grant, sales manager, magnesium division; J. C. H. Stearns, assistant sales manager; J. C. Mathes, development engineer; J. T. Ellis, J. A. Peloubet, R. E. Bockrath, W. H. Gross, and A. M. Lennie, technical service; T. H. Smith and R. D. Sweet, Midland office; W. R. Caple, P. L. Harrington, A. L. Powell, and A. E. Morse, Chicago office; O. E. Grant, E. H. Killheffer, J. B. Reid, H. A. Ellis, and Geo. M. Ahrens, New York office; F. H. Sellars, Philadelphia office; D. T. Wellman, T. H. Caldwell, Jr., and J. F. White, Cleveland office; R. B. Ehlers, Detroit office; A. Smith, Jr., St. Louis office; K. T. Vangsnes, Los Angeles office; all of magnesium division.

Dravo Corp., Pittsburgh. Booth C-638.
Exhibiting (in intermittent operation): One Model No. 60114 Identometer for rapid identification of steel; one Model No. 60115 Identometer electrically operated; one production line, testing trestle and conveyor unit and automatic grinder.
In attendance: Robert Whyte, W. D. Bickel, J. H. Spicer, A. Doschek, H. W. Newman, P. F. Ferry.

Drop Forging Association, Cleveland. Booth D-633.
Exhibiting: Several sets of closed impression die blocks for making forgings; several groups of forgings in various stages of production; possibly a miniature drop forging hammer, if available. A one-color motion picture film illustrating operations in producing forgings if negotiations can be completed for its release.
In attendance: R. M. Seabury, secretary-treasurer; Holloway Kilborn, assistant secretary-treasurer; Lee E. Donnelley, in charge of educational promotion program.

Ductile Chrome Process Co., Detroit. Booth H-608.
Exhibiting: New process of chromium plating (Hard Chrome) non-sulphate process—a chrome that has better adhesion, will not crack off or peel, is non-brittle and ductile—yet harder. Demonstration of materials so plated plus devices to test the chrome and make comparison with existing orthodox chrome plating.
In attendance: I. E. Goodman, Chas. D. Todd, Jr., and Carl D. Macpherson, owners; Robert G. Lunceford, sales manager; Russell Raab, superintendent; Tom Ward, technical.

Du Mont Laboratories, Inc., Allen B., Passaic, N. J. Booth D-605.
Exhibiting (in operation): The Cyclograph—an electronic instrument for testing and sorting both ferrous and non-ferrous materials. A sorting gate, a conveyor, and a feeder—to exhibit the mechanical possibility that can be used in conjunction with the Cyclograph. Oscillographs and cathode-ray tubes—adaptable to the metal industry.
In attendance: L. F. Cramer, vice-president; E. R. Mann, director of materials test laboratory; P. E. Cavanagh, chief metallurgist; David Gross, director of sales, ma-


The DILLON TENSILE TESTER
Small in size yet virtually equal in Performance to the largest, most expensive machines.
For COMPRESSION, TENSILE or TRANSVERSE testing. For long, short or *special* specimens. May be used with extensometer. Hand operated or motorized. Interchangeable indicators from 250 lbs. up to 10,000 lbs. Checks specimens with 150,000 PSI. Maximum hand. Ball bearings. It's beautifully finished and *ACCURATE*. Calibrated with Morehouse Proving Ring certified by Bureau of Standards.
Hundreds in use by leading plants. 10 DAY DELIVERY. Furnished with certificate of calibration. Write for 8 page folder in color.
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terials test division; J. Richard Banker, technical director, industrial electronics department; H. B. Graham, manager of Detroit office; Alfred Crossley, Chicago representative; Michael Alfend, St. Louis representative; Leslie Arries, Washington representative; J. T. Hill, West Coast representative.

DuPont de Nemours & Co., E. I., Wilmington, Del. Booth C-110.

Dyson Sons, Inc., Joseph, Cleveland. Booth F-604.

East Shore Machine Products Co., Cleveland. Booth A-627.

Eastern Smelting & Refining Corp., Boston. Booth B-426.
Exhibiting: Gold and silver in bar and grain form, rolled gold plate, laminated metal, bi-metals in all combinations. Solder filled wire, gold and silver solders, silver solders, and silver brazing alloys, Sterling silver, coin silver in all forms, silver solder rings, and silver solder washers. Triple-distilled electrolytically refined mercury, triple-distilled mercury, redistilled mercury, technical mercury, commerical mercury.
In attendance: Maurice G. Alperin, treasurer; W. H. Martin, Ohio representative; E. J. Morrissey, mid-western representative.

Eastman Kodak Co., Rochester, N. Y. Booth F-617.
Exhibiting: Examples of the newer applications of photography in industry—radiography, photographic templates, ultra-speed photography, X-ray diffraction, micro-filming, electron-micrography, visual training—including representative apparatus.

Ecco High Frequency Corp., North Bergen, N. J. Booth C-624.

Eclipse Fuel Engineering Co., Rockford, Ill. Booth G-601.
Exhibiting (in operation): Crucible type dual melting furnace unit, complete line of steel pots, crucibles for salt, lead, magnesium and aluminum. Burners to be in operation with mixing adjustment and controls to illustrate control principles of burner, mixer and control valve. A complete file of literature describing complete line of equipment.
In attendance: (Rockford)—K. A. Scharbau, L. J. Strohmeyer, E. E. Magnuson, F. F. Marlowe, R. H. Solem, A. D. Wilcox, E. A. Stoner, and A. Stadler. (Representatives)—E. H. Seelbach, Buffalo; C. H. Martin, Chicago; G. T. Desjardins, Cincinnati; W. H. Kay, Cleveland; J. A. Harrison, Detroit; V. C. Leatherby, Cleveland; C. G. Soper, Detroit; H. McPherson, Kansas City; O. L. Maddux, New York; L. B. Maximon, Philadelphia; C. C. Carmody, Pittsburgh; B. T. Ehrnman, St. Louis; O. S. Hubbard, Tulsa; H. H. Etter, Wallingford, Conn.

Elastic Stop Nut Corp. of America, Newark, N. J. Booth A-321.

Electric Furnace Co., Salem, Ohio. Booth S-106.
Exhibiting: Photographs of recent furnace installations and latest developments in special atmosphere equipment for copper brazing, scale-free heat treating and bright annealing ferrous and non-ferrous products including wire, sheet, tubing, strip, stampings, bolts, automotive parts. Also samples of material treated in these furnaces.
Also photographs of outstanding electric, oil and gas fired furnaces built for normalizing, carburizing, short cycle malleableizing, nitriding, forging, enameling, annealing and other heat treating processes; also pictures of gas fired radiant tube furnaces, Elfurno special atmosphere generators, etc.
In attendance: R. F. Benzinger, president; F. T. Cope, general manager; A. H. Vaughan, chief engineer; C. L. West, vice-president; K. U. Wirtz, C. H. Vaughan, N. H. Knowlton, W. F. Ross, E. L. Kerr, and J. R. Moore, sales engineers; G. P. Lozier, superintendent; H. W. Smith, superintendent of erection; B. C. Thompson, Detroit representative; A. F. Kingsley, chief draftsman; and A. E. Wright, advertising manager.

Electric Production Magazine, Cleveland. Booth S-124.

Electro-Alloys Co., Unit of American Brake Shoe Co., Elyria, Ohio. Booth B-122.
Exhibiting: Technical information resulting from research in metallurgy and development in the process of making castings in the experimental foundry. Development of better castings. Radiographic films.
In attendance: W. G. Hoffman, president; W. C. Whyte, vice-president; R. L. Denman, R. Hare and W. D. Hazelton, representatives; E. Cook, chief metallurgist; R. H. Schaefer, assistant chief metallurgist; H. S. Avery, research metallurgist; and H. B. Huntress, J. L. Goheen, and E. N. Reusser, metallurgists.

Elwell-Parker Electric Co., Cleveland. Booths C-421 and D-416.
Exhibiting (in operation): One Elwell-Parker electric lift truck; one Elwell-Parker electric fork truck; one Elwell-Parker electric crane.
In attendance: W. A. Meddick, vice-president; C. B. Cook, vice-president; J. W. Coulton, assistant to the president; R. W. Sanborn, agent; J. P. Lyons, R. F. Crawford, F. J. Avery, and Frank Gill, sales representatives; Wm. Leahy, W. D. Parker, C. Burgy, and Frank Botch, service engineers; R. M. Gamertsfelder, sales promotion.

Engineers Specialties Division, Cleveland and Buffalo. Booth C-429.
Exhibiting (in operation): Precision gage charts for optical comparators, standard radius charts, projector rules, projector scales, protractors, custom-made charts from specifications.
In attendance: Willis De Boer, plant manager; R. G. Deutelbaum, technical service; A. T. Wickham, president.

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Erickson Steel Co., Cleveland. Booth D-403.
Exhibiting (in operation): Erickson precision collet chucks, floating holders, expanding mandrels and tapping chucks.
In attendance: J. S. Howey, sales manager; and service engineers from surrounding territories.

Eutectic Welding Alloys Co., New York City. Booth D-306.
Exhibiting (in operation): Continuous welding operation.
In attendance: R. D. Wasserman, president; Clinton E. Swift, assistant engineer; Harry Kough, welding specialist; Mr. Foege, district sales manager.

Executone Systems, Cleveland. Booth F-613.

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The EUTECTIC Welder
ABRASION AND WEAR RESISTING
These features each month keep you posted on all developments and up-to-the-minute welding news
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★ WELDING DESIGN ★ PRODUCTION IDEAS
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★ NEW MAINTENANCE IDEAS
★ SALVAGING TOOLS

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Name_____ Position_____
Company_____ Address_____

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. . . Who Will Be in Attendance What They Will Exhibit . . . .

Fansteel Metallurgical Corp. and Vascoloy-Ramet Corp., North Chicago, Ill. Booth P-522.
Exhibiting: Products of the rare metals tantalum, tungsten, molybdenum and columbium, including Tantung cast alloy cutting tools and wear resisting parts; Vascoloy-Ramet tantalum-tungsten carbide cutting tools and dies; Fansteel selenium rectifiers, battery chargers and power units; Fansteel tungsten electrodes for atomic hydrogen welding, and Fansteel electrical contacts.
In attendance: H. B. Clark, vice-president and general sales manager; Glen Ramsey, manager, rectifier division; Eugene Roth, eastern district sales manager; T. E. Longley, Cleveland district manager; N. E. Bradley, advertising manager, Vascoloy-Ramet Corp.; Allan L. Percy, advertising manager for Fansteel.

Federal Products Corp., Providence, R. I. Booth P-520.
Exhibiting: Precision measuring instruments for linear dimensions, including dial indicators and dial indicator gages; instruments for controlling dimensions of interchangeable parts for mass production; comparators; dial indicator calipers; dial indicator hole gages; dial indicator snap gages; dial indicator thread gages, etc.
In attendance: L. E. Hodge, and S. I. Dolbey, Cleveland representatives; I. A. Hunt, manager sales promotion and advertising department; L. B. Colt, manager sales department.

Federal Telephone & Radio Corp., Newark, N. J. Booth P-525.
Exhibiting (in operation): 7-kw. and 25-kw. Megatherm high frequency induction heating units. Working demonstrations of several applications of case hardening.
In attendance: V. W. Sherman, manager, industrial electronic division; George Lewis, general commercial department; H. J. Anderson, sales manager, industrial electronic division; R. A. Vogeler, manager Chicago office; E. B. Burlap, V. Wagner, J. D. Lutkus, and A. S. Silcox, sales engineers; T. L. Wilson, laboratory engineer; P. C. Rheinhardt, Jr., general commercial dept.

Ferrotherm Co., Cleveland. Booth C-230.

Finnell System, Inc., Elkhart, Ind. Booth A-427.
Exhibiting: Finnell system of floor maintenance in industrial plants. The Victory Model Finnell—a combination floor scrubbing and vacuum pickup machine self-powered. The Finnell Industrial Dry Scrubber, which quickly digs off stubborn, hazardous coatings of greasy, metal-laden dirt packed hard by traffic on plant floors, is electrically operated. A complete line of cleaning agents and floor treatments, including Setol, a "double-action" cleaner formulated especially for removing oil and grease film and coatings from plant floors quickly.
In attendance: Walter S. Finnell, president; J. Lawrence Anderson, field executive; Russell K. Lewis, factory superintendent; Robert M. Harter, Cleveland district manager, Paul R. Traster, Akron district manager; Robert M. Bliss, manager, industrial sales.

Firth Sterling Steel Co., McKeesport, Pa. Booth B-146.
Exhibiting: High speed and tool steels; stainless steels; Firthite tools and tips; Firthaloy dies and nibs. Also a continuous movie on "Firthite Tools, Manufacture, Maintenance and Use."
In attendance: L. Gerald Firth, president; D. G. Clark, vice-president; B. S. Chapple, assistant to the president; A. B. Corbin, manager of steel division; G. W. Frick, manager of Firthite division; A. R. Zapp, manager of Firthaloy division; O. K. Parmiter, metallurgical engineer; T. W. Gabriel, district manager of Ohio territory; C. F. Hoffman, advertising manager; S. A. Barnes, representative.

Fitzsimmons Steel Co. Booth G-642. (See **Holliday & Co., W. J.**)

Floquil Products, Inc., New York City. Booth F-608.

Forest City Foundries Co., Cleveland. Booth A-626.
Exhibiting: Samples of gray iron and semi-steel castings.
In attendance: P. J. Strangward, chairman of the board; C. F. Seelbach, vice-president and general manager; W. L. Seelbach, secretary and treasurer; A. M. Forrest, sales manager; E. M. Stollenyemer, sales representative; R. G. Wieland, manager "B" division.

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X-RAY Inspected
Heat and Corrosion Resistant
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SINCE 1919

SALT POTS

THE ELECTRO-ALLOYS COMPANY
ELYRIA, OHIO.
MAKERS OF
X-RAY Inspected Thermalloy CASTINGS
HEAT AND CORROSION RESISTANT

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YES! We'll Be At The Metal Show
BOOTH A-626

THE FOREST CITY FOUNDRIES CO.
2500 WEST 27TH ST.
CLEVELAND 13, OHIO

Mention R510 When Writing or Using Reader Service.

Exhibitors—

Foundry. Booth E-146. (See Penton Publishing Co.)

Fox Grinders, Inc., Pittsburgh, Pa. Booth A-218.
Exhibiting (in operation): Abrasive Belt Swing Frame Grinder, which is used for the removal of welds and surfacing of plates, and other finishing operations. One Swing Frame Grinder, using grinding wheels, for use on rough snagging operations.
In attendance: James G. Bair, president; Joseph T. Shull, vice-president.

Foxboro Co., Foxboro, Mass. Booth B-114.

Frontier Bronze Corp., Niagara Falls, N. Y. Booth B-428.
Exhibiting: Frontier 40E ingot and Frontier 40E castings.
In attendance: E. H. Holzworth, president; Wm. J. Boyle, sales manager; Hiram Brown, chief metallurgist.

Fulton Foundry & Machine Co. Booth D-621, D-625, E-624. (See Meehanite Research Institute.)

Furkert Co., E. A., Chicago. Booth C-225.

Gamma Instrument Co., Inc., New York City. Booth D-624.
Exhibiting (in operation): Metallographic microscopes, Brinell microscopes, shop microscopes, photomicrographic cameras, surface projectors, carbon meters, titrators, pH meters, photoelectric colorimeters.
In attendance: C. A. Brinkman, vice-president; Mrs. A. K. Brinkman, secretary-treasurer.

Gas Appliance Service, Inc., Chicago. Booth C-225.

General Alloys Co., Boston. Booth C-146.

General Aniline & Film Corp., Binghamton, N. Y. Booths C-203 and B-209.

General Electric Co., Schenectady, N. Y. Booth G-604.
Exhibiting (in operation): A new electronic heater, rated 50 kw. output, heat treating gears. Samples of products which have been induction heat treated, induction brazed, furnace heat treated, furnace brazed or annealed; photographs of induction heating equipments and electric furnaces.

General Electric X-Ray Corp., Chicago. Booth C-122.
Exhibiting (in operation): Radiographic, fluoroscopic and X-ray diffraction equipment. A wide assortment of radiographs made with the million-volt industrial X-ray equipment. Actual operation of General Electric's new 160-kvp. industrial X-ray fluoroscopic unit, which was designed expressly for the rapid, accurate inspection of light alloy castings. Engineers feel that it will fill the immediate industrial need for a high milliamperage continuous duty visual inspection unit. The apparatus is not intended to replace radiographic inspection because its sensitivity is not equal to that provided by X-ray film examination. However, the sensitivity provided by this new unit more closely approximates radiographic sensitivity than fluoroscopic units previously available.
In attendance: E. W. Page, manager, industrial sales department; F. A. Gardella, Cleveland office manager; and R. E. Holste, R. M. Landis, W. D. Crelley, H. W. Pickett, and C. H. Wantz, industrial engineers.

Globe Machine & Stamping Co., Cleveland. Booth C-409.

Gordon Co., Claud S., Chicago. Booth C-617.
Exhibiting (in operation): Barkling gas fired portable furnace; Weaver atmosphere indicator, and Brown pyrometer.
Non-Operating Exhibits: Hoskins-Jominy furnace, Gordon-Jominy tank and tongs, special Jominy fixture, protecting tubes, insulators, Tempil products, charts.
In attendance: Claud S. Gordon, president; Vincent Manka, assistant to president; G. A. Russ, radiographer; A. L. LaMasters, chief engineer (Chicago); C. O. Anderson, vice-president; Ed. Romig, chief engineer (Cleveland).

Gray-Mills Co., Evanston, Ill. Booth A-416.
Exhibiting (in operation): Four gear type and two centrifugal pumps, capacities to 2200 GPH, 5-ft. head, for coolants, lubricants, quenching fluids, etc. Wet cutting system on horizontal band saw. Coolant pumping unit on belt sander. Fluid refrigerating system.
In attendance: Lloyd L. Mills and John D. Gray, partners; T. H. Glaser and E. W. Scotten, engineers of industrial fluid refrigeration division; Raymond Hollis, advertising and sales promotional manager; Larry Stoddard, O. E. Marthinson, and W. Hal Marshall.

Gulf Oil Corp., Pittsburgh. Booth A-331.

H & H Research Co., Detroit. Booth A-620.
Exhibiting (in operation): H & H reciprocating action tools and accessories. Torit Mfg. Co. dust collectors, self-contained for grinding and polishing wheels. Meehanite surface plates. Detroit surfacing machines.
In attendance: (For H & H Research Co.): I. J. Turnbull, president; W. M. Smith, vice-president; W. W. T. Walker and A. M. Seed, Cleveland representatives. (For H & H Research and Detroit Surfacing Machine Co.): A. G. Ahleman, representative. (For Acme Tool Co.): M. Ehrenhaus, president. (For Torit Mfg. Co.): E. J. Girk, vice-president in charge of sales; C. Sacco, engineer.

Hamilton Kent Manufacturing Co., Kent, Ohio. Booth F-624.
Exhibiting (in operation): A revolutionary type of vibration mount, characterized by striking simplicity in design, and ease of installation. The new mount is a combination shear-compression type, combining all the advantages of shear-mounts with no possibility of over-load of the shear elements. Due to its unique design which releases tensional stress there is minimum fatigue of the rubber element. No rubber to metal adhesives, either chemical or mechanical are used. No special angles, brackets, or radius rods are required for its installation. Installation rarely requires raising a machine more than one inch from its floor base.
In attendance: T. S. Rowe, president; John Fihe, chief engineer.

Hammond Machinery Builders, Inc., Kalamazoo, Mich. Booth E-109.
Exhibiting (in operation): Abrasive belt grinders—Hammond Models V-10, VH-4, VH-6, F-2, F-4, "400," "600" and 600 CG centerless abrasive belt grinders. Backstand idlers—Hammond Models 5-B2, 5-B20, 3 and 4. Automatic deburring, brushing, polishing and buffing machine—Hammond Model SB-6. Cylindrical grinding, polishing and buffing machine—Hammond Model OD-9 for ¼-in. to 9-in. outside diameter work. General purpose grinders—Hammond Model ND-12, completely self-contained grinder and dust collector all-in-one unit. Polishing lathes—Hammond Models 5-VRO and 7-VRRO variable speed polishing lathes. Carbide tool grinders—Hammond Models 4 and CB-76 combination chip breaker and diamond finishing grinder; Model 6, W-10S, 14W and 20-ST wet or dry grinder featuring no spray, no splash guards and safety cup wheel discs.
In attendance: H. J. Kingsbury, chief engineer; A. H. Losey, automatic engineer; S. H. Miller, grinding and polishing engineer; A. T. Vander Linde, engineer; Norman A. Harrison, chief development engineer; W. T. Rietzke, advertising manager.

Handy & Harman, New York City. Booth E-140.
Exhibiting (in operation): Before, during, and after-the-war uses of silver and silver alloys. Display of typical jobs for each period and torch brazing demonstrations will be given daily. The enormous expansion in the use of the silver brazing alloys Sil-Fos and Easy-Flo for war production will be featured and how these alloys can be utilized to best advantage in making post-war products will be shown. Among other silver products there will be silver anodes, silver powdered metals, silver clad metals and silver electrical contacts on display.
In attendance: J. W. Colgan, sales manager; A. W. Swift, manager, Cleveland office; F. T. Van Syckel, advertising manager; A. M. Setapen, development engineer; M. C. Robbins, manager, Chicago office; H. R. Cole, H. De M. Lucas, P. Heding, and D. Kimber, industrial engineers; G. J. Van Haste, advertising department; F. Petrie, laboratory technician.

Harper Co., H. M., Chicago. Booth I-628.
In attendance: R. E. Montgomery; F. M. Ross; K. B. Little, assistant sales manager; T. Stott, assistant sales manager; V. A. Spoehr, sales manager.

Hauck Manufacturing Co., Brooklyn, N. Y. Booth H-617.
Exhibiting: Proportioning oil burners; combination oil and gas burners, both hand controlled and proportioning type; micro cam oil regulating valve; self-cleaning oil valve.
In attendance: F. John Schwenk, sales manager; A. J. Turpin, chief engineer; Herbert H. Vogelsang, Cleveland district representative; Jules Escheman, Chicago district manager.

Heil Engineering Co., Cleveland. Booth P-521.
Exhibiting: Chemical resisting equipment including tanks lined with plastic, ceramic and lead. Standard tanks typified by the well known Heil Utility tank, three-compartment electrically heated. Heating devices for pickling, plating and anodizing tanks, including steam jet agitators, Nocorodal coils, and a heat exchanger.
In attendance: C. E. Heil, H. P. Heil, Dick Protiva, Gene Huth, Bernard Mulheran.

Hercules Electric & Mfg Co., Inc., Brooklyn, N. Y. Booth H-605.
Exhibiting (in operation): Arc welding machines, magnetic aligners, AC-DC rectifiers, transformers, chokes and coils, solenoids, electric controls.
In attendance: P. T. Flood.

Hevi Duty Electric Co., Milwaukee. Booth D-142.
Exhibiting: Photograph panels.
In attendance: Norman Bloye, vice-president; Arthur H. Oberndorfer, advertising manager; George A. Chutter, vice-president and New York district manager; Dale Sieben, New York; Richard Wiberg, Springfield, Mass.; Arthur W. Frank, Chicago district manager; Lawrence Tilden, Chicago; James Ayling, Cleveland district manager; C. P. Critzer, Cleveland.

Hild Floor Machine Co., Chicago. Booth B-142.
Exhibiting (in intermittent operation): Model C Hild 16-in. ½-h.p., and Model D Hild 19-in., ¾-h.p. floor scrubbing machines. Various attachments for both wet and dry scrubbing of all types and kinds of floors, such as cement, concrete, terrazzo, wood, linoleum, asphalt, tile, etc.
Model 21 Hild all-purpose industrial vacuum machine, used to remove dirty soap and water from floors, after scrubbing with Hild machine, or mopping by hand. Used to remove dust and dirt from machinery, pipes, floors, walls, etc.
In attendance: Fred C. Hild, president; Hazel I. Hild, vice-president; Walter Harper, Chicago; Gene Mitchell, Detroit; L. J. Williamson, Indianapolis, and R. M. Jones, Cleveland, all sales engineers on floor maintenance.

Hitchcock Publishing Co., Chicago. Booth G-629.
Information of interest to the metalworking industry. Data on industrial markets in Latin America obtained by Hitchcock representatives who supervised distribution of industrial export catalogs. A center for editorial information on new developments in equipment as well as sales promotional possibilities in Latin America. Copies of *Machine Tool Blue Book, Resale,* and industrial export catalogs.
In attendance: Robert C. Van Kampen, president; Wesley Paulson, editor of *Machine Tool Blue Book;* V. C. Hogren, business manager and editor of *Resale;* Dudley B. Trott, Cleveland representative; A. C. Feigert, Western Ohio representative.

Holcroft & Co., Detroit. Booth C-217.
In attendance: R. T. Cadwell, general manager; C. L. Joy, chief engineer; A. Ruckstahl, engineer; J. A. Dow, metallurgist; J. H. Bradley, engineer; D. A. Blair, engineer; H. J. Hammond, metallurgist; M. R. Larson, metallurgist; W. E. Ruckstahl, metallurgical engineer; R. H. Cadwell, director of purchases; Geo. C. Wilsher, engineer; B. E. French, engineer; Geo. Stark, engineer; W. O. Rowley, expeditor; C. H. Martin, Chicago rep.

Holden Co., A. F., New Haven, Conn. Booth B-147.
Exhibiting: Displays and literature.
In attendance: A. F. Holden, president; H. Solakian, vice-president; E. P. Belden, treasurer; J. B. Carey, C. M. Vincent, A. F. Blackwood, and H. A. Moffat, field engineers.

Holliday & Co., W. J., Hammond, Ind. Booth G-642.
Exhibiting (in operation): A Cincinnati Shaper which will be used to demonstrate the free machining qualities of our hot rolled Speed Case and Speed Treat plate. Certain items of finished tools, such as various types of plastic molds and dies and some types of metal forming dies.
In attendance: (For W. J. Holliday & Co.)—W. J. Holliday, vice-president; C. O. Bucksot, vice-president; L. M. Van Deman, sales manager. (For Monarch Steel Co.)—F. T. Holliday, president; S. W. Terry, general sales manager.

Houghton & Co., E. F., Philadelphia. Booth C-130.
Exhibiting: Heat treating salts and work processed, together with metallurgical data; including martempering (interrupted quenching); core binders and castings; rust preventives, together with test plates and photographs; lubricant display, featuring hydraulic oils and plant lubrication service; new type of all-purpose cutting base; demonstrations of new aviation-type "V" packings.
In attendance: G. W. Pressell, executive vice-president; D. J. Richards, assistant director of sales; H. E. Martin, sales manager (Detroit); E. C. Barlow, sales manager (Pittsburgh); A. A. Miller, sales manager (Chicago); James McElgin, manager metal research; A. P. Seasholtz, metal engineer; D. C. Miner, advertising manager; W. C. Morgan, research department; H. E. Sanson, general sales manager; R. W. Justice, John Taylor, W. C. Hollander, W. C. Redlin, L. C. Dunn, J. Q. Adams, A. L. Spencer, E. E. Hedler, sales representatives; Frank Ross, lubrication sales manager; R. J. Rathbone, technical representative.

Howe & Son, Inc., Hinsdale, N. H. Booth C-232.
Exhibiting (in operation): A new automatic saw sharpener for sharpening and salvaging expensive high speed hack saws, band saws, circular saws. A new bolt and nut threading machine (can also be used for knurling at high production). A new combined drill grinder-carbide tool grinder and tap grinder. A new abrasive polisher and surfacer for round or flat work.
In attendance: W. S. Howe and assistant.

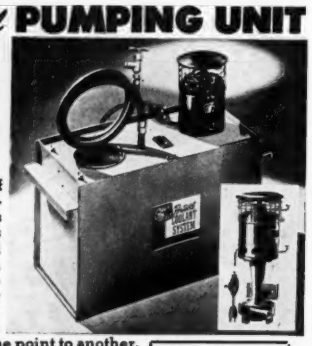
Ideal Commutator Dresser Co., Sycamore, Ill. Booth B-207.

Illinois Testing Laboratories, Inc., Chicago. Booth D-138.
Exhibiting (in operation): Temperature measuring and controlling instruments, both portable and stationary. Air velocity measuring instrument.
In attendance: Martin J. Rauscher, sales manager; W. S. Evans, R. C. Chelius, T. R. Law.

Illinois Tool Works, Chicago. Booth C-310.

Independent Pneumatic Tool Co., Chicago. Booth C-611.
Exhibiting (in operation): Thor portable electric drills, screw drivers, nut setters, grinders, sanders, polishers, buffers, wire wheel brushes, hammers, saws, nibblers for all such metal-working operations as drilling, reaming, tapping, driving screws, setting nuts, welding, grinding, metal servicing, sanding, finishing and

NEW! GRAY-MILLS Centrifugal PUMPING UNIT



For Pumping:
Coolants • Cutting Oils
Lubricants
Hydraulic Oils
Quenches • Chemicals
Other Fluids

• In hundreds of applications Gray-Mills Pumping Units are supplying fluids to machine tools and other equipment in constant flow or intermittently. They are used for recirculating fluids or to pump liquid from one point to another.

Available in standard models, gear and centrifugal types, they have capacities from 60 to 2200 g. p. h.; 12 to 50 lbs. p. s. i.

Gray-Mills Pumping Units are the ideal, low-cost answer to most any fluid handling problem—if yours is a special application a G-M Engineer will gladly talk it over.

Stop in Booth A-416 at the Metal Show—see a demonstration.

NEW Model 1130 Centrifugal PUMPING UNIT for applying coolants to cut-off machines, grinders, and other tools. Heart of the unit is Model 1100 Gray-Mills Centrifugal Pump (inset). Pump is available as independent unit.

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GRAY-MILLS CO.
1957 RIDGE AVENUE • EVANSTON, ILLINOIS
PROMPT DELIVERY
Complete Portable Pumping Units

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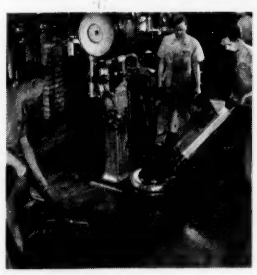

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B-142
Natl. Metal Congress

Hild Equipment scrubs and dries oily factory floors without interrupting production. Leaves floors dry and slip-safe . . . prevents accidents. Same equipment with special attachments dry-scrubs floors heavily caked with grease and metal-shavings. Speedily cleans and smooths floors without loosening wood blocks or other damage.

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polishing, cutting sheet metal and tubing, chipping, scaling, and bushing. Accessories for portable power tools including grinding wheels, rotary files, sanding and polishing pads and discs, star drills, chisels, screw driver bits and nut setting sockets.
In attendance: P. L. Stetler, district manager; C. B. Baron, manager, electric tool division; E. F. Slattery, manager, accessories division; C. N. Kirchner, sales promotion manager; and L. E. Rindfleisch, C. W. Leonard, Fred McNamara, and C. R. Bishop, service engineers.

Indium Corp. of America, New York City. Booth B-612.
Exhibiting: Ores, concentrates and finished products of indium. Also selected articles showing applications of indium.
In attendance: William S. Murray, James R. Underwood, M. T. Ludwick.

Induction Heating Corp., New York City. Booth D-340.
Exhibiting (in operation): Thermonic induction heating as applied to hardening and brazing using a Model 1670 Thermonic induction generator. Samples heat treated by this method. Demonstrations of Thermonic dielectric heating of non-conducting materials.
In attendance: J. Wesley Cable, sales manager; N. Levin, J. H. Garger, F. W. Curtis, A. N. Hoelz, and H. B. Carlock, development engineers; W. C. Rudd, chief engineer; D. Osterer, secretary; E. S. Goodridge, president; R. S. Wile, chief metallurgist; R. Stanton, assistant chief engineer; J. Moran, project engineer.

Industrial Bulletin, Chicago, Ill. Booth K-601.
Exhibiting: Publications.
In attendance: Louis Galter, publisher; Max Reiner, representative.

Industrial Heating, Pittsburgh. Booth S-130.

Industrial Publishing Co. Booth F-630. (See **Industry & Welding** and **Die Casting.**)

Industrial Tape Corp., New Brunswick, N. J. Booth C-218.

Industry & Welding, Cleveland. Booth F-628.
Exhibiting: Publications.
In attendance: Irving B. Hexter, president and publisher; Lester P. Aurbach, vice-president and general manager; Jerome R. Peskin, associate editor; Norman Lott, mid-west sales representative; L. Rees, mid-central sales representative; B. Pomeroy, special services.

Instrument Specialties Co., Inc., Little Falls, N. J. Booth C-325.
Exhibiting: "Micro-processed" beryllium coppper coil and flat springs; Silvercote wire and Carson Electronic Micrometer spring testers.
In attendance: R. W. Carson, vice-president; H. G. Williams, chief metallurgist; George H. Koelliker, field engineer; J. D. Roberson, field engineer.

Internal Surface Projector Co., Mineola, N. Y. Booth H-636.

Iron Age, New York City. Booth A-415.
Exhibiting: Copies of *The Iron Age*, editorial reprints, market and circulation data.
In attendance: J. H. Van Deventer, president and editorial director; C. S. Baur, vice-president and general manager; T. W. Lippert, editor; H. E. Leonard, C. H. Ober, Robert F. Blair, R. M. Gibbs, B. L. Herman, H. K. Hottenstein, Peirce Lewis, D. C. Warren, F. J. Oliver, T. C. Campbell, T. E. Lloyd, C. T. Post, D. C. MacDonald, S. H. Brams, O. L. Johnson, B. H. Hayes, R. E. Baur, C. N. Baur, A. H. Dix, W. M. Hoffman.

Johns-Manville, New York City. Booth K-610.
Exhibiting (in operation): Insulations, refractories, and packings for use in the metals industry. Demonstrations to show the efficiency of J-M Insulating Fire Brick and Fireblok under operating conditions. The speed and ease in which special refractory shapes can be cast with Johns-Manville Firecrete is also given actual demonstration.
In attendance: G. V. Dutney, assistant manager industrial department; G. E. Grimshaw, staff manager, industrial insulation department; A. B. Curtis, manager insulation department, Cleveland; J. S. Charles, sales representative, Philadelphia; E. W. Rosenberger and R. M. Langley, sales representatives, Pittsburgh; L. E. Mohr and R. Doepke, sales representatives, Chicago.

Johnson & Son, Inc., S. C., Racine, Wis. Booth G-612.
Exhibiting: Background display pictorially describing the application of Johnson's Industrial Wax on metals and metal parts. Display of war material (small items) which have been coated with wax, and display of peacetime products (small items) which have also been coated with wax.
In attendance: Walter Bridgeman, manager, field research division; John H. Hurley, manager, industrial division; Harvey W. Blankenship, sales promotion manager, industrial division; J. E. Bruce, manager, Cleveland district; Robt. Paap, industrial division.

Jones Co., C. Walker, Philadelphia. Booth G-624.

Kelley Co., J. W., Cleveland. Booth P-515.
Exhibiting: Industrial oils; heat treating products.
In attendance: J. W. Kelley, president; A. F. Ruffner, metallurgist; O. T. Myers, Buffalo representative; Vincent Kennedy, Detroit representative; H. H. Pleasance, Indianapolis representative; B. O. Platell, Cleveland representative; E. H. Cooper, Cleveland representative; D. D. Kelsey, Erie representative.

Kelley-Koett Manufacturing Co., Covington, Ky. Booth D-314.
Exhibiting (in operation): 140-kv. conveyor fluoroscope; high intensity film illuminator. (Non-operating): 250-kv. self-contained X-ray machine; X-ray accessories and supplies.
In attendance: A. H. Feibel, president; G. E. Geise, vice-president; J. H. Bell, director of sales; R. W. Mayer, manager industrial sales; W. P. Thoma, industrial sales; David Sussin, chief engineer; L. C. Stork, factory manager; Scott W. Smith, physicist; L. L. Schleiffer, Cleveland branch manager; F. Winnen, Cleveland representative; H. J. Carpenter, Akron representative; W. T. Knipp, Toledo representative;

Kennametal, Inc., Latrobe, Pa. Booth B-130.
Exhibiting: Kennametal blanks, tools, milling cutters, lathe and grinder centers, files, and specialties.
In attendance: Philip M. McKenna, president; Alex G. McKenna, vice-president; Donald C. McKenna, Claremont, Calif., vice-president; W. L. Kennicott, chief engineer; Fred W. Pennington, advertising manager; H. W. Alexander, vice-president, Kennametal of Canada, Ltd.; R. B. Weeks, Chicago district manager; H. J. Braun, C. J. Marlett, and W. D. Weeks, Chicago representatives; Geo. J. Raible, Cincinnati, Ohio; A. M. Kebe, Cleveland district manager; C. W. Frizelle, L. W. Morton, and E. D. Porter, Cleveland representatives; Bennett Burgoon, Jr., Detroit district manager; Chas. F. Jeffers, Detroit representative; J. Arthur Deakin, Sr., New York district manager; Jas. A. Deakin, Jr., and G. W. Sharpe, New York representatives; Chas. E. Washburn, Boston; Lawrence W. Guild, Springfield, Mass.; R. S. Hudgins, Hartford; Robert H. Pyle, Indianapolis; C. M. Wheelock, Milwaukee district manager; C. W. Cromer, and J. E. Williams, Milwaukee representatives; Wm. S. Jones, Philadelphia district manager; Paul A. Herr, B. E. Middleton, and Harris H. Robbins, Philadelphia representatives; Walter Greenleaf, Wilkinsburg, Pa., district manager; Pierce Fraunheim, Joseph J. Gabrick, and Bernard W. Minch, Wilkinsburg representatives; John Wilcox, Erie, Pa.; Fred Hennig, Rochester, N. Y.; C. W. Moore, Atlanta; F. E. Doty, Houston; Geo. Kavanaugh, Dallas.

Kent Company, Inc., Rome, N. Y. Booth F-625.
Exhibiting (in operation): Electric scrubbing, electric mopping, and dry vacuum equipment.
In attendance: C. E. Clifford, sales manager; M. G. Steele, chief engineer; G. C. Carley, representative.

King, Andrew, Narberth, Pa. Booth B-138.
Exhibiting: King portable Brinell hardness tester, weighing only 26½ lb., puts an actual load of 3000 kg. on a 10-mm. ball. Test head removable for accurately testing large, heavy or irregularly shaped parts. Easily carried to the work, eliminating moving heavy parts. King folding Brinell microscope provided with automatic, self lighting. Weighs 9 oz., easily carried in pocket.
In attendance: Andrew King; Wm. L. Jobe, assistant.

Knu-Vise, Inc., Detroit. Booth S-102.

Kold-Hold Manufacturing Co., Lansing, Mich. Booth D-118.
Exhibiting (in operation): One Model 505T90 unit—a 5.05 cu. ft. capacity unit operating at 90° F.
In attendance: F. A. Haag, sales manager; E. A. Thiele, special representative; Mrs. Lee S. Worthington, advertising manager; R. D. Spitler, sales engineer; Lyle F. Young, sales engineer; J. R. Tranter, president.

Kolene Corp., Detroit. Booth H-629.
Exhibiting (in operation): A practical demonstration of cleaning and preparing metal surfaces for tinning (with high-lead alloy) and electro-zinc plating. The surface preparation process is the principal part of the exhibit, the "tinning" and "electro-plating" being merely to demonstrate the efficiency of the process.
In attendance: J. H. Shoemaker, president; H. G. Webster, chief chemist; E. F. Cordial, representative; W. A. Rodgers, representative.

Krouse Testing Machine Co., Columbus, Ohio. Booth B-427.
Exhibiting (in operation): Sheet, plate, spring, and direct stress fatigue testing machines; instrument vibration testing machine.
In attendance: G. N. Krouse, president; C. P. Roberts; and J. F. Hall, engineers.

Kux Machine Co., Chicago. Booth A-311.
Exhibiting (in operation): Model No. 65 automatic powdered metal press; Model BH-18 combination zinc, aluminum high pressure die casting machine; special cams.
In attendance: James J. Kux, vice-president; George Kux, vice-president; Casimer Bieniasz, plant superintendent.

Lakeside Steel Improvement Co., Cleveland. Booth E-122.
Exhibiting: Specimens and photographs showing results and samples of heat treated materials. Also descriptive methods applied, both theoretical and practical.
In attendance: C. W. Derhammer, president; R. T. Morrow, vice-president and sales manager; Michael Tomko, metallurgist; Edw. Esner, general superintendent; Rudy Ristau, production manager.

Lead Industries Association, New York City. Booth P-507.
Exhibiting: Lead and lead alloy coating of iron and steel—one of the important newer uses of lead. Lead and lead alloy coated sheet, wire, hardware, radio parts and other fabricated products. Methods of installing lead protection for industrial X-ray apparatus. Lead welding uses and techniques. A variety of modern industrial applications of lead, many of them new, such as aircraft counterbalances and new type storage batteries, designed to show the broad usefulness of lead to modern industry and how its various properties promote its varied applications.
In attendance: F. E. Wormser, secretary-treasurer; Robert L. Ziegfeld, assistant secretary; David M. Borcina, and J. Leland Benson, representatives.

Leeds & Northrup Co., Philadelphia. Booth C-222.
Exhibiting: Solutions of present-day production problems in the smelting, refining, heating and heat treatment of metals. A "Strategy Table" will be used to "integrate" the selection of the best automatic control system for any given, specific problem. The table can be operated to flash into view all types of Micromax control instruments; to show which primary elements can be used with each; to show which kind of control action each can exert, and the mechanisms used.
Also the latest Engine-Test Recorder—a superfast heavy-duty machine for temperatures of 140 points at machine-gun rate in an airplane engine in flight.
A "Strategy Table" for furnaces flashes into view selected parts heat treated by L&N furnace methods; shows the equipment used for the part, and shows the factors which the equipment controls.
In attendance: A. E. Tarr, A. F. Moranty, O. Brewer, D. E. Moat, L. E. Emerich, G. C. Graf, T. C. Smith, H. S. Vecella, E. I. Hope.

Lepel High Frequency Laboratories, Inc., New York and Chicago. Booth H-610.
Exhibiting (in operation): High frequency induction heating equipment for hardening, brazing, soldering, annealing, forging and melting purposes. Work tables for soldering and brazing applications. Quenching tables for hardening and quenching applications. Self-containing automatic quenching fixtures. Automatic timing devices. Multiple brazing fixtures and coils.
In attendance: S. L. Teitler, president; Henry Petersen, vice-president and chief engineer; Otto Weitman, research engineer; H. H. Watjen, manager, sales and service; C. L. Jennings, T. J. Murphy, W. M. Grim, K. A. Dean, J. J. Fox, and W. S. Williams, field engineers

Lester Engineering Co. Booth A-341. (See **Lester-Phoenix, Inc.**)

. . . Who Will Be in Attendance What They Will Exhibit . . . .

Lester-Phoenix, Inc., Cleveland. Booth A-341.
Exhibiting (in operation): One Lester injection molding machine for plastics, Model 1-4-4, in 4-ounce capacity, making thermoplastic moldings. One Lester-Phoenix die casting machine for non-ferrous alloys. Model HHP-1 CC, for aluminum, brass, magnesium, with conversion equipment for the die casting of zinc alloys. Capacity in aluminum from 1¼ to 4¼ lb., and in zinc from 4 to 6 lb.
In attendance: G. A. Davies, Jr., and G. G. Watson, Eccles & Davies Machinery Co., Los Angeles; Elmer C. Maywald, Chicago; A. R. Morris, Charles R. Austerberry and J. Earl Austerberry, J. C. Austerberry's Sons, Detroit; Steven F. Krould, New York City; Lionel B. Kavanagh, Jack Kavanagh, and Howard L. Chase, Standard Tool Co., Leonminster, Mass.; A. B. Geers, Index Machinery Corp., Cincinnati, Ohio; J. C. Fletcher, J. C. Fletcher Machinery Co., San Francisco. (For Lester Phoenix, Inc.): Fred C. Ziesenheim, sales manager. (For Lester Engineering Co.): Nathan Lester, president; D. White, vice-president; W. H. Schwartz, chief engineer. (For Phoenix Machine Co.): Harry E. Bollinger, president; H. H. Jeck, secretary; Fred Mayer, shop superintendent.

Lewis Machine Co., Cleveland. Booth A-210.

Lewis-Shepard Products, Inc., Watertown, Mass. Booth B-421.

Light Metal Age, Chicago. Booth I-642.
Exhibiting: Publications.
In attendance: Roy Fellom, Jr., editor and publisher; W. B. Griffin, managing editor; Thomas D. Roche, advertising representative.

Lindberg Engineering Co., Chicago. Booth C-150.
Exhibiting: Photographs and printed literature; advice on heat treating equipment and problems.
In attendance: C. H. Stevenson, vice-president; F. A. Hansen, vice-president; L. A. Shea, sales manager; Douglas Rader, advertising manager; E. R. Schorr, advertising (laboratory furnaces); W. C. Thomas, sales (laboratory furnaces); salesmen from the various territories.

Lipe-Rollway Corp., Syracuse, N. Y. Booth B-219.

Lithium Co., Newark. Booth K-620.
Exhibiting (in operation): Push button control slide projector.
In attendance: Charles E. Thomas, chief engineer; Harold J. Ness, president; Marvin J. Reynolds, vice-president; Alfred R. Becker, secretary; J. B. McAllister, sales engineer; Peter Anderson, engineer; Robert June, R. W. Farrar, and E. M. Prior, representatives; Richard Bentel, Richard Craushore, and Andrew B. Christenson, metallurgists.

Los Angeles Chamber of Commerce, Los Angeles. Booth A-630.
Exhibiting: Map showing western states and Los Angeles.
In attendance: Augustus Slater, industrial engineer.

Lukens Steel Co. & Divisions; By-Products Steel Corp., and Lukenweld, Inc., Coatesville, Pa. Booth B-110.
Exhibiting (in operation): 16-mm. Kodachrome motion pictures as follows:
"Head Work (sound), which deals with the spinning and pressing of heads by Lukens Steel Co.
"The Manufacture of Lukens Clad Steels" (sound), which deals with the manufacture of nickel-clad, inconel-clad and monel-clad steels.
"World's Largest Plate Mill" (silent) depicts the casting of 110,000-lb. ingot and its subsequent rolling on 206-in. mill. This picture also includes the spinning of one of the largest heads ever produced.
In attendance: (Lukens Steel Co., Divisions and Subsidiaries): J. Frederic Wiese, vice-president in charge of combined sales; George M. Gillen, assistant manager of combined sales; William Butler, 3rd, advertising manager; Franklin Beltrando, advertising department; Paul D. Mallay, manager railroad division; Herbert B. Lewis, manager machinery division.
(Lukens Steel Co.): George A. Cardwell, manager of alloys; Everett C. Gosnell, chemical engineer; Herbert A. Ottey, manager of flanging sales; Dr. William G. Theisinger, director of welding research.
(By-Products Steel Corp.): Harry R. Meyer, manager of sales; Marvin C. Moffett, products engineer.
(Lukenweld, Inc.): Robert C. Sahlin, manager of sales; Edward J. Charlton, assistant to the president.

Lukenweld, Inc. Booth B-110. (See **Lukens Steel Co.**)

Maas and Waldstein Co., Newark, N. J. Booth C-209.

Machine Design. Booth E-146. (See **Penton Publishing Co.**)

Machine Tool Blue Book. Booth B-629. (See **Hitchcock Publishing Co.**)

Machinery, New York City. Booth E-141.
Exhibiting: Trade papers and engineering books.
In attendance: Edward B. McEntee, technical representative; W. E. Robinson, advertising manager; Dwight Cook, eastern advertising representative; Erik Oberg, editor; Charles O. Herb, managing editor; H. L. Horton, associate editor; C. I. Sommer, exhibit manager.

Machinery Manufacturing Co., Los Angeles. Booth C-234.
Exhibiting: Complete line of Cal-Cutter carbide tipped milling machine cutters.
In attendance: J. V. Westbrook, and J. S. Carwalho, field engineers.

Magnaflux Corp., Chicago. Booth E-621.
Exhibiting (in operation): Production-line Magnaflux (magnetic particle) equipment for inspection of bolts, studs and other small parts, latest types of portable Magnaflux equipment. General purpose equipment for Zyglo (fluorescent penetrant) inspection of all metals and other solids. Latest stresscoat equipment for brittle coating method of strain analysis.
In attendance: A. V. deForest, chairman board of directors; F. B. Doane, president; C. E. Betz, first vice-president; W. E. Thomas, manager field engineering; Greer Ellis, manager Zyglo and Stresscoat division; T. deForest, second vice-president; J. E. Clarke, research engineer; F. B. Stern, Jr., engineer; F. S. Catlin, Jr., engineer; K. E. Glover, engineer; R. N. Baughman, manager, Cleveland office; D. P. Walsh, manager, Detroit office; Helen E. Goonrod, technical correspondent; and G. L. C. Dehn, K. Van Kirk, M. J. Van Baalen, C. D. Foster, H. Migel, N. A. Andree, C. N. Ring, and C. A. Cox, field engineers.

Exhibitors—

Magnetic Analysis Corp., Long Island City, N. Y. Booth C-415.
Exhibiting (in operation): Magnetic analysis equipment for inspection of steel bars and tubing. Magnetic analysis demagnetizer for demagnetizing steel bars and tubing. Magnetic analysis comparator for separating ferrous materials and parts as to analysis, condition, structure and processing.
In attendance: Wm. S. Gould, Jr., president; T. Zuschlag, chief engineer; F. O. Fischer, J. D. Wilfong, Jr., V. L. Spoley, R. C. McMillen, and R. R. Regen, field engineers; R. E. Schuck, assistant field engineer.

Mahr Manufacturing Co., Minneapolis. Booth B-134.
Exhibiting: Photos and literature.
In attendance: W. G. Barstow, vice-president; D. D. Knowles, advertising manager; D. R. Grandy, sales representative.

Mallory & Co., Inc., P. R., Indianapolis, Ind. Booth E-601.
Exhibiting (in operation): Parts made from Mallory non-ferrous alloys (Elkaloy A, Elkonite, Mallory 3 Metal and others) consisting primarily of spot welding tips, seam welding wheels, flash, butt and projection welding dies, water-cooled holders and miscellaneous products such as springs, bushings, bearings and castings. A complete showing of Mallory electrical contacts of tungsten, silver, molybdenum, Elkonite and special alloys for every type of service. Representative contact test apparatus from the Mallory measurements laboratory. A representative display of bearings, bushings and parts fabricated from strip stock by the Mallosil process of bonding silver and other precious and rare metals to base metals.
In attendance: F. H. Carpenter, assistant general sales manager; R. H. Imes, sales manager, contact division; H. D. Weed, sales manager, resistance welding division; Clifton Taylor, sales manager, special metallurgical products; E. I. Larsen, metallurgical engineer, development section; E. F. Holt, metallurgical engineer, resistance welding section; J. W. Wiggs, contact sales; E. F. Allison, Cleveland district sales manager; O. V. Miller, Detroit district sales manager; W. M. Hayes, customer relations section; J. E. Templeton, P. M. Cook, A. R. Gaus, Don Drake, Henry Bond, and Bruce Chatterton, sales department; Walter Craigle, advertising department.

Martindale Electric Co., Cleveland. Booth D-325.
Exhibiting (in operation): Portable motor-driven flexible shaft tools—trade name "Martindale Motor-flex Units". Martindale Electrical Etchers for writing on iron and steel. Dust respirators—trade name "Martindale Protective Masks". Martindale Rotary Burs and Files made of high-speed steel.
In attendance: E. H. Martindale, president; W. N. Osbun, Jr., assistant sales manager; Roy E. Blersch, sales engineer.

Mechanite Research Institute, New Rochelle, N. Y. Booth D-621.
In attendance: C. E. Herington, director, engineering service; Carolyn Smith, assistant advertising manager; J. C. Beattie, engineering department, Fulton Foundry & Machine Co.; H. C. Huff, sales engineer, Fulton Foundry & Machine Co.

Mercury Products Co., Cleveland. Booth A-425.
Exhibiting (in operation): Tombill drill sharpener; Tombill countersinking machine; Tombill centering machine for centering shafts at both ends simultaneously.
In attendance: W. E. Raney, general manager; Anne M. Olson, assistant general manager; George Krause; superintendent; H. B. Hazerodt, factory representative, Ohio, Michigan and West Virginia; James H. Cross, and B. E. Spitzer, factory representatives, Pennsylvania and western New York.

McDill, Rex D., South Euclid, Ohio. Booth F-623.

Metal Finishing, New York City. Booth C-139.

Metal Finishing Service, Chicago. Booth C-214.
Exhibiting: Micro-Finishing; Micro-Peening; Lundbye Process of Flash Chromium Plating; hard chromium plating; Anodizing and plating of aluminum; industrial silver and gold plating; brass plating for rubber adhesion; black nickel plating; tin plating.
In attendance: E. E. Hawkinson and Edward Bell.

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NEW MICRO-PEENED FINISH AVAILABLE

Micro-Finishing to less than 5 micro-inches is now available for production use by the Micro-Airbrasive Process. This process has been developed for production use of the newest abrasive (unlimited quantities) in particle sizes of —20 microns, —10 microns and —5 microns for Micro-Honing and Micro-Peening.

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Metal Industries Catalog. Booth D-431. (See **Reinhold Publishing Corp.**)

Metal Progress, Cleveland. Booth S-116.

Metal Treating Institute, Philadelphia. Booth C-141.
In attendance: Horace C. Knerr, president; Stewart N. Clarkson, executive secretary; Franklin T. Chapman, treasurer.

Metallizing Co. of America, Chicago. Booth I-619.
Exhibiting: Mogul Metallizing equipment and affiliated accessories.
In attendance: H. D. Engelsman, sales manager; H. L. Lindblad, A. W. Lindblad, W. J. Brown, Henry Buchner, H. W. McKinney, and A. Q. Neil, Jr., field engineers.

Metallizing Engineering Co., Inc., Long Island City, N. Y. Booth H-624.
Exhibiting (in operation): Metco Metallizing Guns Type E, 2E and 3E. Also cutaway model showing Power Control Unit in operation. Fuse-Bond, electrical surface preparation. Metcolizing, process for protection of high temperature equipment against oxidization and scaling.
In attendance: R. J. McWaters, assistant sales manager; R. G. Ballou, district manager; D. C. Boltz J. G. Hammond, and R. S. Flaherty, field engineers.

Metallurgical Laboratories, Inc., Philadelphia. Booth C-141.
Exhibiting (in operation): Commercial heat treatment of metals, showing numerous applications of the modern heat treating art in war and peace.
In attendance: Horace C. Knerr, president; E. R. Aemisegger, vice-president; George A. Richardson, sales manager; Franklin T. Chapman, assistant to president; Dr. Igor Zavarine, research metallurgist; and others.

Metals and Alloys. Booth D-431. (See **Reinhold Publishing Corp.**)

Metals Review, Cleveland. Booth S-116.

Michiana Products Corp., Michigan City, Ind. Booth B-131.
Exhibiting: Heat resistant and corrosion resistant alloy castings.
In attendance: H. Klouman, vice-president; H. E. Ardahl, assistant to the vice-president; C. Q. Swenson, Detroit

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MARTINDALE MOTOR-FLEX UNITS

Four styles for bench, floor or overhead use.

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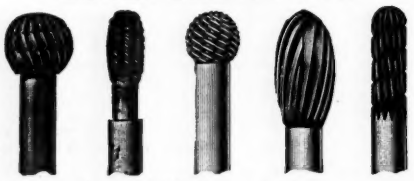
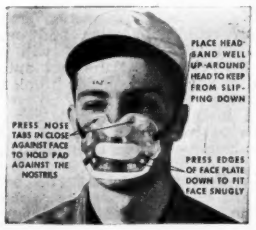


More than 100,000 Burs and Files in various shapes carried in stock for immediate shipment.


PLACE HEADBAND WELL UP-AROUND HEAD TO KEEP FROM SLIPPING DOWN
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These light-weight masks furnish protection against non-toxic dusts except free silica and asbestos. Refills can be inserted in five seconds.

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Michigan Steel Casting Co., Alloy Casting Division, Detroit. Booth P-519.
Exhibiting: Alloy castings for heat and corrosion resisting applications.
In attendance: W. A. Hakin, consulting engineer; A. F. B. Thompson, product engineer; E. A. Christensen, Detroit sales; A. A. Gould, Cleveland sales.

Michigan Steel Casting Co., Fabricated Products Division, Detroit. Booth C-226.
Exhibiting: Welded equipment for the metallurgical and chemical industries.
In attendance: Paul Goetcheus, manager, fabricated products division; Joseph Harrison, Michigan sales representative; J. J. O'Sullivan, Chicago sales representative.

Michigan Steel Casting Co., Precision Casting Division. Detroit. Booth H-628.
Exhibiting: Representative group of typical precision castings in carbon and stainless steels.
In attendance: E. D. Flintermann, president; J. D. Corfield, vice-president; R. J. Wilcox, chief metallurgist.

Microfilm Corp., Cleveland. Booth F-610.
Exhibiting (in operation): The Microfilming of engineering drawings and other basic records. A Microfilm-by-Microstat camera, photographically compressing drawings up to 30 x 40 in. on 35-mm. film. Full size, facsimile, Microstat reproductions as projected from the film through the same camera.
The Microfilm-by-Microstat process provides permanent record protection against loss by fire, flood, explosion, pilferage or other destruction. The contents of a four-drawer file can be recorded on a 100-ft. roll of film, which the customer files in his safe deposit box at the bank. An insurance policy defrays the cost of Microstat reproductions if the records are destroyed by causes beyond the owner's control. The Microfilm Corp. sells the service, not the machines. All visitors to the Microfilm exhibit will receive a free Microfilm made for their individual use.
In attendance: Carl F. Lezius, president; Creighton Davies, general manager; F. Bert Allen, technical manager; William J. Fintze, creative director; Robert Montgomery, George Fox, and Pearson Browne, sales engineers; Chester Cleland, survey engineer; Walter Fathauer, service engineer; L. H. Harvey; R. Zychick.

Mid-Continent Metal Products Co. Booth E-609. (See **National Machine Gas Burner Division.**)

Midland Paint & Varnish Co., Cleveland. Booth B-210.
Exhibiting: No-Spat Welding Fluid which prevents welding spatter from adhering to metal surfaces. It reduces cleaning time and labor costs to a minimum. No-Spat also protects metal against rust. No-Spat requires no mixing — apply and start welding at once. No time wasted.
In attendance: R. E. Fuldauer, president; W. P. Fuldauer, treasurer; V. M. Murphy, vice-president; F. S. Glueck, assistant treasurer.

Mill & Factory. Booth D-629. (See **Conover-Mast Corp.**)

Mine Safety Appliances Co., Pittsburgh. Booth C-142.
Exhibiting: Complete line of personal and plant protective equipment vital to modern production needs. Products include M.S.A. Comfo and Dustfoe dust respirators, abrasive masks, dust sampling and counting instruments, skullgard protective hats, safety shoes, first aid kits and cabinets, welding shields and helmets, goggles and faceshields, cover glass, Fend protective hand creams, Foille burn spray kits, and asbestos and duck protective clothing.
In attendance: J. B. Davies, industrial sales manager; C. H. Mehaffey, industrial department; Graham Straub, industrial department; J. W. McCrackin, Cleveland district representative; B. W. Catalane, Buffalo district representative.

Minneapolis-Honeywell Regulator Co. Booth F-601. (See **Brown Instrument Co.**)

Minnesota Mining & Manufacturing Co., Saint Paul. Booth A-605.
Exhibiting (in operation): The 3-M method of grinding and finishing by use of segment face wheels and Three-M-ite abrasive belts used in conjunction with backstand idlers of bench and floor model types. Demonstration of a swing grinder which uses a special segmented wheel and 3-M abrasive belts. This method of finishing is versatile and proves a decided time-saver, making it possible to grind and finish irregularly shaped parts speedily.
In attendance: J. C. Duke, abrasive sales manager; A. H. Butz, regional sales manager; G. S. Bond, advertising manager; H. R. Herchenrider, sales manager, methods group; R. K. Grinden, methods engineer; A. L. Perkins, methods engineer; W. E. Dent, advertising department; C. C. March, products manager, gluebond coated abrasives; J. E. Clarke, products manager, waterproof abrasives division; K. J. Shea, sales manager, Detroit branch; R. N. Scott, O. L. Pedersen, and P. L. Richardson, methods engineers.

Molybdenum Corp. of America, Pittsburgh. Booth D-137.
Exhibiting: Ferro-alloys and chemicals of tungsten, molybdenum, boron.
In attendance: M. Hirsch, president; W. H. Phillips, vice-president; E. A. Lucas, vice-president; N. F. Tisdale, metallurgical engineer; E. Steward, Western district manager; J. A. Berger, research metallurgist.

Monarch Steel Co. Booth G-642. (See **Holliday & Co., W. J.**)

Morrison Engineering Corp., Cleveland. Booth 404.
Exhibiting (in operation): Combination aluminum or brass convection heated forge furnace. Recirculating type pit furnace.
In attendance: J. R. Morrison, president; H. L. Sipe, treasurer; J. R. Hall, chief engineer; E. J. P. Fisher, manager of sales; A. R. Sautters, sales engineer; G. E. Fisher, A. F. Heaps, F. J. Deertz.

Motch & Merryweather Machinery Co., Cleveland, Ohio. Booth C-621.
Exhibiting (in operation): One No. 3 automatic hydraulic sawing machine, 12 h.p.; one No. 4 M & M hydraulic cold sawing machine, 17 h.p.; one No. 1 grinder, ¾ h.p.; a number of Motch & Merryweather "Triple Chip" segmental type saw blades.
In attendance: E. J. Kossuth, sales manager saw division; Lee McClelland, factory manager; Richard MacFadden, service engineer; Albert Hopkins, sales engineer; Frank Holberger, factory superintendent; R. E. Mason, sales engineer; W. R. Valentine, assistant sales manager saw department; J. G. Moohl, chief engineer.

Motor Products Corp., Deepfreeze Division, North Chicago, Ill. Booth A-402.
Exhibiting (in operation): Standard Cascade unit for shrink fitting. Equipment will have temperature recorder in full view showing operation at from —120 to —150° F. Also vacuum top for this equipment.
In attendance: Howard R. Roberts, general sales manager; E. Lynn Werner, advertising manager; R. E. Peterson, metallurgist; Fred W. Whitcomb, field engineer; M. R. Crossman, advertising account executive; Clare F. Jack, Cleveland engineer; Erwin Maus and R. D. Hanna, Cleveland distributors.

National Bronze and Aluminum Foundry Co., Cleveland. Booth P-501.

National Engineering Co., Chicago. Booth D-133.
Exhibiting (in operation): One 18-in. Laboratory Simpson Mixer with glass crib allowing full view of the mulling action. Also, complete illustrated photograph of installations in the chemical and metallurgical fields. In addition, a 24-in. Laboratory Simpson Intensive Mixer equipped with heating elements, stainless steel, and vacuum. This machine will be operating on test mixtures.
In attendance: Fred W. Fuller, field engineer for Ohio; Elwood A. Peterson, assistant sales manager; Bryon Ellis, laboratory technician.

National Industrial Publishing Co., Pittsburgh. Booth S-154.

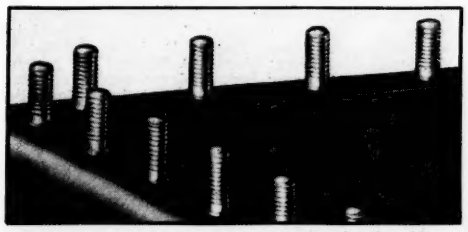
National Machine Gas Burner Division of Mid-Continent Metal Products Co., Chicago. Booth E-609.
Exhibiting (in operation): National Machine Hyperbo Burners and proportional mixers firing a cutaway furnace. Another cutaway furnace equipped with a National Kinetic Curtain burner on automatic controls. A working model installation of an immersion fired water tank. A completely automatic air heater in operation and a display of gas burning equipment.
In attendance: S. K. Zitzewitz, president; E. J. Haedike, secretary; C. F. Petersen, sales manager; S. Zavodny, engineer.

Nelson Specialty Welding Equipment Corp., San Leandro, Calif. Booth P-502.
Exhibiting (in operation): Stud welding equipment of all kinds. Stud welding under water. Multi-gun unit for industrial production line; new "Model J" completely D. C. welder; display rack of studs as used by over 460 manufacturers showing studs as used in locomotive cabs, petroleum refineries, power houses, shipyards, electrical transformers, heavy machinery, etc. Continual demonstrations of end-welding studs to metal in ½ sec.

Nelson Stud Welders *automatically* end-weld studs in ½ second!

At Booth P-502

- Saves up to 75% of your time and material cost.
- Used in more than 460 shipyards and industrial plants.
- Complete fusion results between stud and metal . . . *automatically.*
- Easily used by inexperienced help . . . no welding experience necessary.



Studs secured without drilling, tapping or hand welding —no holes to weaken the casing. *The welds are stronger than the strength of the stud!*

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New Equipment Digest. Booth E-146. (See **Penton Publishing Co.**)

Niagara Blower Co., New York City. Booth P-518.

Nichols-Morris Corp., New York City. Booth B-215.
Exhibiting (in operation): Two Nichols millers, one with standard equipment and one with lever rack and pinion cross feed to demonstrate the versatility of the machine. One "Bemisine" sine-angle plate for angles from 0 to 90°. One Ellis Dividing head, 6½ in. with quick indexing arrangement and index plate.

Nitralloy Corp., New York City. Booth B-222.

North American Manufacturing Co., Cleveland. Booth C-320.
Exhibiting (in operation): A North American combination oil-gas burning system, including the Turbo Blower, automatic control valves, proportioning devices and burner. The new automatic blower intake control mechanism installed on a North American Turbo Blower.
In attendance: G. R. Brown, president; G. F. Naab, general manager; Z. D. Basset, secretary; Otto Lutherer, chief engineer; O. C. Bernhard, vice-president; N. H. Davies, sales manager; G. C. Davis, Chicago district manager; C. E. Sladky, Cleveland district manager; M. S. Baskin, H. C. Beik, Julius Converse, Ted Davies, W. F. Guenther, S. E. Shepard, R. A. Smart, and S. M. Truitt, field engineers.

North American Philips Co., Inc., New York City. Booth J-605.

Nox-Rust Corp., Chicago. Booth H-625.

Oakite Products, Inc., New York City. Booth E-134.
Exhibiting (in operation): New wartime developments in cleaning materials for various types of metals; including the new revolutionary Oakite CrysCoat Process for preparing ferrous metals before painting or other organic finishing. Specially designed materials for surface preparation of aluminum before spot-welding. Various Oakite equipment, samples of war work, manuals, booklets, blueprints.
In attendance: H. C. Duggan, division manager; J. T. McQuillin, M. R. Stevens, J. H. Timmins, W. L. Russell, and W. W. Cothran, technical field service representatives.

Ohio Carbon Co., Cleveland. Booth G-603.

Ohio Crankshaft Co., Cleveland. Booth A-340.
Exhibiting (in operation): One each 7½, 15-20, 30 and 50-kw. machines, operating. One 200-kw. machine, non-operating. The 20-kw. unit will operate at 450,000 cycles, all others at 9600 cycles. Actual operations include brazing carbide tips to tool shanks; heating 3 by ⅝-in. diameter slugs for forging; hardening springs progressively; surface hardening small bearings or shafts; surface hardening track pins. Display of small parts hardened and brazed with Tocco, and large parts heated by Tocco for forming or forging operations.
In attendance: W. C. Dunn, president; F. S. Denneen, secretary-treasurer; W. E. Benninghoff, manager; A. O. Wood, chief engineer; H. B. Osborn, research director; M. A. Tran, chief metallurgist; L. C. Schweitzer, Chicago district manager; K. Stumpf, New England manager; H. Swartley, New York manager; R. Rolf, Cleveland manager.

Ohio Overall Cleaning Co. and Sani-Clean Service, Inc. Cleveland. Booth A-634.
Exhibiting: Industrial wiping towels and industrial garments.
In attendance: Roy A. Hoge, sales manager; H. A. Humphrey, treasurer; C. D. Brown, assistant secretary-treasurer; Thos. Conley, vice-president; John Meissner, secretary; Pete Karcher, salesman; J. C. MacIsaac, salesman; Rita Trochim, secretary; Mary Lou Humphrey, secretary.

Ohio Steel Foundry Co., Springfield and Lima, Ohio. Both D-134.
Exhibiting: Fahrite heat resisting alloy castings. Technical pamphlets giving metallurgical and engineering information.
In attendance: J. E. Galvin, president; T. H. Harvey, vice-president; E. A. Walcher, vice-president; J. D. Hagans, sales manager; F. J. Blaney, superintendent; I. D. Cline, advertising manager; L. E. Welch, metallurgist; C. E. Tanner, representative.

Olson Filtration Engineers, Chicago. Booth D-626.

Omega Research Laboratory, Inc., Detroit. Booth G-610.
Exhibiting: A display board depicting the solving of typical metal problems that have caused difficulties for various manufacturers. Enlargements of pages from a typical report, showing how the various divisions of the corporation cooperated in solving a problem. Illustrations with samples and photographs of problems in machinability, heat treating, magnetic inspection, and analysis.
In attendance: J. P. O'Donnell, president; F. M. Miller, vice-president; J. F. Coultier, general manager.

O'Neil-Irwin Mfg. Co., Minneapolis. Booth C-640.
Exhibiting (in operation): Complete set of Di-Acro precision machines. The Di-Acro Shear No. 1, Brake No. 1 and Bender No. 1 mounted on a table so that they can be operated by visitors. Samples of parts which have been produced with these machines.
In attendance: G. H. Danielson, sales manager; A. T. O'Neil, research engineer; V. Linder, designing engineer; G. Larson, production manager.

Osborn Manufacturing Co., Cleveland. Booth B-618.
Exhibiting (in operation): Brushing lathe.
In attendance: M. C. Pecsok, sales manager; F. T. Turner, assistant sales manager; G. O. Rowland, advertising and sales promotion; R. O. Peterson, manager of technical department; Verne Charvat, technical engineer; P. A. Mead, technical engineer.

Owens - Corning - Fiberglas Corp., Toledo, Ohio. Booth B-214.

Ozalid Products Division, General Aniline & Film Corp. Booth B-209.

Pangborn Corp., Hagerstown, Md. Booth A-611.

Park Chemical Co., Detroit. Booth D-141.
Exhibiting: Technical information, heat treating materials, advertising material, catalogues.
In attendance: W. P. Woodside, chairman, board of directors; F. L. Woodside, president; Arvid A. Wadson, vice-president; H. D. Kitchen, secretary-treasurer; L. M. Harris, general sales manager; Paul H. Kramer, technical director; Charles R. Foreman, metallurgist; A. A. Aponick, J. P. Clark, Jr., T. J. Clark, Richard Hammerstein, Robert N. Lynch, Fred W. Reiber, J. C. Thompson, and W. P. Woodside, Jr., service engineers.

. . . Who Will Be in Attendance What They Will Exhibit . . . .

Parker Appliance Co., Cleveland. Booth B-604.
Exhibiting (in operation): A comprehensive hydraulic display consisting of a variety of tube fittings, control valves, cylinders, and other hydraulic units piped and operating in a manner to convey to all concerned the meaning of "Fluid Power Engineering." This exhibit will consist of a control panel of several valves at the front of the booth, by which means a visitor may, by remote control, complete, one at a time, each of the six functions of Fluid Power. These six basic functions will be dramatized in simple motion on the back panel of the booth. A typical line of Parker products will be illustrated in a descriptive piece.
In attendance: A. L. Parker, president; C. E. Klamm; Paul Kozak, Jr., show manager; F. E. Amon, sales manager; Paul Webb, sales department; A. O. Bates, works manager; L. H. Schmohl, chief engineer; Henry Reese; E. C. Hartley, chief, development and research; Henry Hull, development engineer; C. E. Nyden, sales department; D. A. Cameron, sales department; R. H. White, New York branch manager; C. D. Whitehorn, Chicago branch manager; P. R. Brainard, Dayton branch manager; R. H. Davies, sales department.

Peerless Tool and Engineering Co., Inc., Chicago. Booth B-409.
Exhibiting: Jigs, fixtures, gages and dies that produce precision parts. Precision machined parts.
In attendance: O. B. Lawrenz, president; M. E. Lawrenz, vice-president; A. W. Schultz, sales engineer.

Penton Publishing Co., Cleveland. Booths E-146 and D-414.
Exhibiting: Publications—*Steel, The Foundry, Machine Design, New Equipment Digest, Revista Industrial.* Technical books, literature, market reports.
In attendance: J. W. Zuber, circulation and promotion manager; R. M. Klein, circulation manager; D. G. Hewitt and F. H. Hammon, circulation representatives.

Phillips Manufacturing Co., Chicago. Booth P-530.
Exhibiting (in operation): Electrically heated and operated vapor degreasers; electrically heated and operated plastic melting tanks; mechanically operated metal parts washers; electrically operated emulsion surge washers for metal parts; full line of industrial soaps, powders, alkalis, and industrial chemicals; chlorinated solvents.
In attendance: Mortimer B. Phillips, president; John M. Bash, secretary-treasurer; Ralph A. Van Fossen, technical director; S. B. Shutts, chemical engineer; Earl Harris, field service director; Erben A. Jenkins, research engineer; James Kehoe, Minneapolis-St. Paul sales engineer; A. Haeffner, Pittsburgh; Roscoe Stovall, Indianapolis-Cincinnati; J. Hanley, advertising manager.

Phoenix Machine Co. Booth A-341. (See **Lester-Phoenix, Inc.**)

Physicists Research Co., Ann Arbor, Michigan. Booth B-121.
Exhibiting (in operation): Profilometer, instrument for measuring surface roughness of machined parts. Demonstrations of standard instrument, as well as special fixtures and accessories used therewith. Motion picture illustrating the operation of the Profilometer.
In attendance: John M. Trytten, publicity manager (in charge of exhibit); E. A. Wolter, assistant business manager; Robert P. Stone, head, field service department; Frank Kabat, Wayne Klager, Fred J. Engelke, Bruce Waggoner, and B. W. Poland, field representatives.

Picker X-Ray Corp., New York City. Booth G-617.
Exhibiting (in operation): Industrial radiographic and fluoroscopic equipment; X-ray diffraction apparatus; complete line of X-ray accessories.
In attendance: L. C. Kotraschek, manager, industrial division; George Myers, research engineer; C. A. Stirling, district manager, Cleveland; R. Filston; F. W. Sullivan, district manager, Detroit; R. B. Corcoran, district manager, Chicago; R. W. Thomas, district manager, Pittsburgh.

Pines Engineering Company, Inc., Aurora, Ill. Booth F-620.
Exhibiting (in operation): Two-spindle automatic profiling machine for threading pipe nipples. Automatic hydraulic bending machine for bending 1-in. tubing. Metal shelving for holding miscellaneous tools.
In attendance: B. F. Bower, president; John Dunham, vice-president; Lester Nelson, chief draftsman; Glen Hamlin, superintendent.

Poor & Co. Booth C-428. (See **Promat Division.**)

Porter-Cable Machine Co., Syracuse, N. Y. Booth L-103.
Exhibiting (in operation): The many advantages experienced in the several thousand installations of Porter-Cable Wet Belt Surfacers. Visitors are invited to bring samples of work that may be done on these machines to see what can be accomplished by this New Wet Belt Machining method. The latest model Porter-Cable Wet Belt Surfacer, together with the new production table. Other Porter-Cable machines including the irregular Wet Belt Surfacer, the smaller 4-in. Wet Belt Surfacer, as well as the wet combination line contract and flat type, a new machine. Electric hand saws, electric hand sanders, dry grinders and sanders.
In attendance: Cliff Stewart, district sales representative, Cleveland; H. A. Kimball, Columbus representative; William Stellhorn, Toledo representative; J. M. Smith, Detroit representative; H. L. Ramsay, sales manager, Syracuse; M. H. Rochelle, Syracuse; Fraser A. Hurd, designing engineer, Syracuse.

Precise Products Co., Racine, Wis. Booth A-309.
Exhibiting (in operation): Precise-35 high speed, high power, portable electric hand tools at 35,000 r.p.m.; Coolflex flexible shaft attachment at 35,000 r.p.m. All tools will operate and be shown grinding, milling, polishing, deburring, various materials, ranging from hardened high speed steel to rubber and plastics.
In attendance: H. W. Schumann, general manager; Rob. Schumann, chief engineer; A. M. Seed, sales engineer; W. T. Walker, sales engineer.

Exhibitors—

Precision Scientific Co., Chicago. Booth I-605.
Exhibiting (in operation): Submerged type metallurgical specimen cutter; Hydraulically operated specimen mounting press; Air-operated mounting press; Automatic metallurgical specimen polisher; Hand specimen polisher; Miscellaneous metallurgical equipment.
In attendance: A. I. Newman, vice-president; E. D. Hole, metallurgist; R. W. Bergen, eastern sales representative.

Product Engineering. Booth B-111. (See **American Machinist.**)

Progressive Welder Co., Detroit. Booth B-413.

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Promat Division, Poor & Co., Waukegan, Ill. Booth C-428.
Exhibiting (in operation): Furnace with control equipment to demonstrate firing of "Porcenell," a low temperature vitreous finish. Also a Promat Kicker unit to superimpose A.C. on D.C. current in the demonstration of zinc and cadmium plating with the Promat process.
In attendance: A. E. Chester, chief of research; J. S. Hicok, sales manager of electroplating; D. Hayward, sales manager of ceramic finishes; W. Hodson, sales engineer.

Pyrometer Instrument Co., New York City. Booth C-331.
Exhibiting: Pyro optical pyrometers, radiation, immersion and surface pyrometers.
In attendance: A. Bollerman, secretary.

Radium Chemical Co., Inc., New York City. Booth E-640.
Exhibiting: Radium containers, shipping and storage boxes for radium, as well as radiographs taken using radium as the radiation source.
In attendance: Joseph A. Kelly, president; George T. Taylor, vice-president; George H. Loftus, vice-president; Philip D. Johnson, technical advisor.

Ransburg Co., Harper J., Indianapolis, Ind. Booth E-110.

Ransohoff, Inc., N., Cincinnati, Ohio. Booth A-601.
Exhibiting (in operation): Two cleaning machines. One, a drum type washing, rinsing and drying machine complete with Ransohoff vertical pumps without stuffing boxes or packing glands. Machine will have a soak wash, spray wash, spray rinse and dry. The other machine is a Ransohoff Roto-Matic washing, rinsing and drying machine which requires a space 8 ft., 6 in. by 9 ft., and is arranged to load and unload from one point. This machine is also equipped with Ransohoff vertical pumps without stuffing boxes or packing glands.

Ransome Machinery Co., Dunellen, N. J. Booth B-102.

Redmer Air Devices Corp., Chicago. Booth C-630.
Exhibiting (in operation): Three drill presses and one milling machine for cross drilling, threading, drilling and milling operations using Redmer collet air-operated holding fixture.
In attendance: Edwin Redmer, president; Standley Redmer, secretary-treasurer; Albert Redmer, engineer; Erwin Knocke, sales manager.

Reeves Pulley Co., Cleveland. Booth P-527.

Reinhold Publishing Corp., New York City. Booth D-431.
Exhibiting: *Metals and Alloys*, the engineering magazine of the Metal-Working Industries; "Metal Industries Catalog;" technical books.
In attendance: (For Metals and Alloys)—P. H. Hubbard, vice-president and publishing director; W. P. Winsor, vice-president and business manager; E. F. Cone, consulting editor; F. P. Peters, editor-in-chief; K. Rose, engineering editor; H. Knight, news editor; A. E. Fountain, M. S. Kearney, and J. H. Stonhouse, district managers; J. Zellner, circulation manager. (For Metal Industries Catalog)—H. B. Lowe, vice-president; D. Hoagland, district manager. (For Book Department) —S. Sweet, assistant sales manager; Helen McManus.

Republic Drill & Tool Co., Chicago, Booth H-611.

Resale. Booth G-629. (See **Hitchcock Publishing Co.**)

Resistance Welders Manufacturers Association. Booth D-336.
In attendance (For Electroloy Co.): R. H. Taylor, R. S. Donald, N. B. Gilliland, R. E. Enyeart. (For National Electric Welding Machines Co.): E. C. Smith, president; C. E. Shearer, sales manager; C. F. Kaunitz, vice-president; H. C. Cogan, chief engineer; W. O. Little, Cleveland; S. Fisher, chief welding engineer; J. R. Brueckner, vice-president and Detroit representative; L. E. Nichols, chief field engineer, Detroit; D. A. Clements, St. Louis. (For Sciaky Bros.): Maurice Sciaky, Mario Sciaky, Wm. R. Bernardi, H. B. Alyea, Neil Conover, Robert Santini, H. T. Platz. (For S-M-S Corp.): G. N. Sieger. (For Taylor-Hall Welding Co.): P. M. Hall. (For Eisler Engineering Co.): Charles Eisler and Charles Eisler, Jr. (For P. R. Mallory & Co.): F. H. Carpenter, assistant general sales manager; R. H. Imes, sales supervisor, electrical contacts; H. D. Weed, sales supervisor, resistance welding products; Clifton Taylor, sales supervisor, special metallurgical products; E. F. Allison, sales manager, Cleveland district; O. V. Miller, sales manager, Detroit district; E. F. Holt, resistance welding engineer; J. W. Wiggs, electrical contact sales; E. I. Larsen, metallurgical engineer, development section; P. N. Cook, general sales; W. M. Hayes, general sales; Earl Templeton, general sales; Walter Craigle, advertising manager. (For Welding Sales & Engineering Co.): W. H. Simmons and A. J. Last. (For Swift Electric Welder Co.): F. H. Taylor, A. H. Lewis, E. S. Taylor. (For Thomson-Gibb Electric Welding Co.): H. B. Warren, W. T. Ober, I. C. Brown.

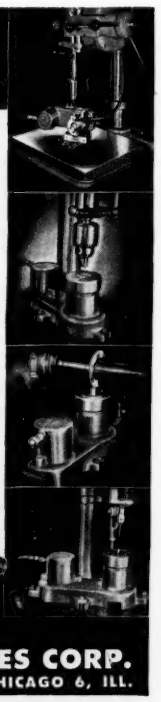
Revere Copper and Brass, Inc., New York City. Booth B-306.
Exhibiting: Numerous examples of new and interesting developments in the application of Revere metals for present and post-war products. In addition to covering the field of copper and copper alloys, the advantages and uses of Revere's new light metal alloys of magnesium and aluminum are especially featured. Complete and up to the minute information on all Revere alloys.
In attendance: W. G. Seidlitz, plant manager, ordnance division, Chicago, in charge of exhibit; E. S. Bunn, metallurgical manager, magnesium-aluminum division, Baltimore; E. G. D'Vileskis, assistant works manager, Dallas division, Chicago; R. K. Snively, technical advisor, Baltimore division; L. W. Morrell, assistant sales manager, J. H. Reese, technical advisor, A. B. Two, technical advisor, S. P. Snyder, assistant technical advisor, Dallas division, Chicago; D. T. Applebee, assistant sales manager, V. C. Hoover, technical advisor, C. H. Kuthe, technical advisor, and R. T. Roberts, technical advisor, Michigan division; N. Pope, assistant sales manager, F. D. Wilimek, technical advisor, New Bedford division; L. E. Gibbs, technical advisor, C. P. Plovanich, technical advisor, Rome division; L. J. Galbreath, assistant sales manager; J. R. Hunter, manager, welding research, Rome, N. Y.; J. R. Lumm, district manager, Cleveland; H. E. Riegler, district manager, Cincinnati; D. Hickman, assistant district manager, Philadelphia.

Revista Indusrtial. Booth E-146. (See **Penton Publishing Co.**)

Reynolds Metals Co., Louisville, Ky. Booth D-617.
Exhibiting: Samples of aluminum sheet, strip, plate, wire, rod and bar stock, tubing, extruded shapes, forgings, fabricated parts, aluminum foil, and aluminum powder and paste.
In attendance: S. L. Manning, in charge of booth; Paul Ziegler, chief metallurgist; T. L. Fritzlen and R. B. Gray, research institute; L. E. Householder and R. B. Smith, metallurgists; W. E. Edwards and A. E. Hines, aluminum; Henry Grend, aluminum powder and paste; A. L. Fulkerson, foil; W. K. Hunt, parts division.

Rheem Research Products Inc. & Rheem Mfg. Co., Baltimore. Booth A-320.
Exhibiting (in operation): Iridite, an olive drab chemical treatment for zinc and cadmium plated surfaces to prevent corrosion and as an excellent paint base. Iridite has been accepted by all the armed forces under such specifications as: An-P-32, 57-0-2u.c., etc. Shells, cartridge cases, smoke pots, steel drums and many other war products plus hot water heaters and boilers being manufactured in the 14 Rheem plants throughout the country.
In attendance: (For Rheem Mfg. Co.) Robert B. Trezevant, production engineer; R. E. James, appliance engineer. (For Rheem Research Products, Inc.) H. S. Bartholomew, manager of sales; E. R. Kraft, S. S. Pierce, and L. F. Richard, sales engineers; A. J. Connor, sales office manager.

Redmer AIR CHUCK



Accurately holds the depth at the same time it automatically centers parts for drilling, milling, tapping, etc. Needed in every plant where second operation work is done. Also for assembly or wherever a holding fixture to do precision operations is needed. Uses Brown and Sharpe type screw machine collets and simplifies "setting-up" operations and in most instances eliminates the making of jigs or fixtures.
Has low consumption of air and its simplicity of construction eliminates expensive repairs.
Four models — No. 00 — No. 0 — No. 2 and No. 2 Special. Collet capacity from 1/16 to 1¾.

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Richards Co., J. A., Kalamazoo, Mich. Booth B-330.
Exhibiting: Twistite drill press vises; Multiform bender-cutters.
In attendance: J. A. Richards, Sr., Paul A. Richards.

Riehle Testing Machine Division, American Machine and Metals, Inc., East Moline, Ill. Booth A-424.
Exhibiting (in operation): 60,000-pound Riehle Model P-2 universal hydraulic testing machine; 17 to 30 ft.-lb. impact tester; Brinell hardness tester; measuring instruments.
In attendance: A. S. Rairden, sales manager; Clyde Peterson, assistant to sales manager; Francis Huyser, chief engineer; Mike L. Millett, service engineer; R. W. Denman, advertising manager.

Rustless Iron & Steel Corp., Baltimore. Booth C-102.
Exhibiting: Four large oil paintings by the famous industrial artist, Peter Helck. Display of fabricated stainless steel products.
In attendance: C. L. Kingsbury, vice-president and general manager; G. D. Moomaw, vice-president in charge of production; E. P. Geary, assistant vice-president in charge of sales; P. B. Kline, manager eastern sales; T. L. Moore, manager western sales; W. B. Pierce, manager market development division; S. P. Watkins, manager sales engineer department; J. L. Cotsworth, advertising manager; A. L. Feild, technical director; A. Earle Higgins, advertising counsel; R. W. Harris, Cleveland district manager; K. M. Ford, Cleveland sales engineer; R. H. D'Ardenne, Pittsburgh sales engineer; H. S. RuDesill, Detroit district manager; Frank R. Wright, Buffalo district manager; R. L. Springer, Chicago district manager; E. H. Widerman, Cincinnati district manager; R. W. Dietrich, Baltimore district manager.

Ryerson & Son, Inc., Joseph T., Cleveland and Chicago. Booth B-141.
Exhibiting (in operation): Jominy end-quench hardenability tests. Small electric furnace, Jominy fixture, grinder and Rockwell tester will be used.
In attendance: Greswold Van Dyke, manager special steels division, Chicago; W. O. Springer, manager special steels department, Cleveland; Voigt Proctor, manager special steels department, Cincinnati; Weaver Falberg, special steels department, Cincinnati; John M. Acee, manager special steels department, St. Louis; C. S. Hegel, manager special steels department, Milwaukee; John Queen, Jr., manager special steels department, Jersey City; George Roeder, manager special steels department, Buffalo; A. C. Burke, manager special steels department, Boston; J. P. McGough, manager, Cleveland plant; and H. E. Bodie, F. D. Lothrop, S. J. Mills, M. T. Pattie, L. F. Quedenfeld, and E. D. Roberts, sales representatives.

Salkover Metal Processing Co., Inc., Chicago and Long Island City, N. Y. Booth G-611.
Exhibiting: Parts assembled and brazed with copper in controlled atmosphere electric brazing furnaces.
In attendance: N. M. Salkover, president; Lawrence Jacobsmeyer, general manager; Robert Rainier, manager, Long Island plant.

Sani-Clean Service, Inc. Booth A-634. (See **Ohio Overall Cleaning Co.**)

Scherr Co., Inc., George, New York City. Booth E-130.
Exhibiting (in operation): Scherr Limited Budget Inspection Laboratory including Scherr gear testers, toolmakers' microscopes, binocular microscopes, Wilder micro projectors, Gibbs high speed automatics, Opti-Flat surface plates, the new optically polished glass plates, Scherr Gage Block Utility Set, employing gage blocks; Atlantic Emergency Plug Gage Sets; Reed Micrometers; Magne-Blox products, GS Dial Test Indicators; Ultra-Chex Length Standards; surface plates, angle irons, sine bars, Magni-Ray optical inspection equipment, Scherr Comparitols. A number of attachments for the gear testers and Comparitols showing actual examples of work being checked with these instruments.
In attendance: George Scherr, president; F. Koenig, secretary; K. F. Kirchhofer, sales manager; J. C. Fackiner and Adam Crystle, sales engineers.

Schraders Son, A., Division of Scovill Mfg. Co., Brooklyn, N. Y. Booth H-633.
Exhibiting (in operation): Pneumatic machine controls for all types of machines designed to give increased production with added safety features. Pneumatic valves of all descriptions.
In attendance: F. L. Engstrom, sales manager, industrial sales division; A. Jorgensen, T. R. Cottrell, and J. Meister, sales representatives.

Scovill Mfg. Co. Booth H-633. (See **Schraders Son, A.**)

Selas Corp. of America, Philadelphia. Booth D-122.
Exhibiting (in operation): Demonstrations and interpretations of six new techniques in process heating: (1) "Patterned" radiant combustion (furnace roof, furnace wall, free panel). (2) "Speed-Heating" of heavy work (billets, rolls, forgings, castings). (3) Automatic production-line "Machine-tools-for-heat-treatment." (4) "Assembly-by-heat" (through silver alloy brazing). (5) Selective, localized heat treatment with gas and air. (6) "Function-Fitted" combustion (through special ceramic burners). Advanced means of gas-air premixing and flow metering.
In attendance: Frederic O. Hess, president; James Kniveton, engineering consultant; J. A. Ehlinger, chief engineer, furnace division; Fred Maud, chief engineer, automatic machinery division; Carl P. Mann, manager, drying division; A. A. Furczyk, chief development engineer; James B. Henwood, development engineer; Paul F. Berg, development engineer; Carl R. Berger, Jr., metallurgical engineer; G. V. Jordan, Jr., scientific equipment division; Richard C. Jordan, Philadelphia district representative; Eugene D. Allen, Detroit; W. M. Smith, New York; Warren D. Fuller, New England; J. A. Smith, Chicago; Jack J. Kerns, service engineer; Harry W. Smith, Jr., manager, technical information department; Charles W. Eigenbrot, advertising department.

Sentry Co., Foxboro, Mass. Booth C-324.
Exhibiting (in operation): Simplified high speed steel hardening with Sentry Diamond Block method of atmospheric control in Sentry Model "Y" electric high speed steel hardening furnace. Sentry diamond blocks; Sentry Model "V" combustion tube furnace; Sentry Model "YP" vertical high speed steel hardening furnace.
In attendance: Gordon Wheeler, sales manager; Murray Winter, president; P. B. Crocker, general manager; G. B. Duff, district manager, Newark, N. J.; G. S. Ewing, sales engineer, Newark; B. M. Brownell, district manager, St. Louis; C. W. Rudolph, district manager, Chicago; D. R. Grandy, district manager, Cleveland; T. R. Nicklas, sales engineer, Cleveland; C. R. Pollock, district manager, Detroit.

Shakeproof, Inc., Chicago. Booth C-310.

Sheldon & Co., E. H., Muskegon, Mich. Booth J-611.
Exhibiting: Laboratory furniture.
In attendance: E. J. Sheridan, vice-president and sales manager; R. E. Worick, R. B. Morrison, R. M. Maxwell, and L. W. Smack, salesmen.

Shell Oil Co., Inc., New York City. Booth J-604.
Exhibiting (in operation): Properties and application of Shell metal cutting oils, drawing oils, rust preventive oils, quenching oils, hydraulic oils, drawing compounds.
In attendance: E. L. Bastian, C. E. Brown, and W. H. Day, head office lubricants technical representatives.

Sherman & Co., New York City. Booth F-621.
Exhibiting (in operation): Brazing by Nu-Braze silver brazing alloys and Nu-Braze Flux, by induction and torch methods.
In attendance: Monroe Sherman; Samuel Shaw, sales engineer; Dorothy Livingston, Nu-Braze sales.

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Size Control Co., Chicago. Booth C-213.

Sly Manufacturing Co., W. W., Cleveland. Booth A-306.
Exhibiting (in operation): Blast equipment—a cabinet and a small mill with a suitable exhaust and dust collecting unit, for blast cleaning or surface peening of a great variety of metal parts.
In attendance: R. W. Helmig, production manager; R. O. Mullen, assistant sales manager; L. B. Brewster, Cleveland sales engineer; E. M. Faflick, sales engineer; F. E. Wolf, Detroit sales engineer; Arthur H. Bond, Western New York sales engineer.

Smith Tool & Engineering Co., Bucyrus, Ohio. Booth I-616.
Exhibiting: Surface plates and lapping plates.
In attendance: K. C. Jenney, sales manager; S. K. Kalber, engineer.

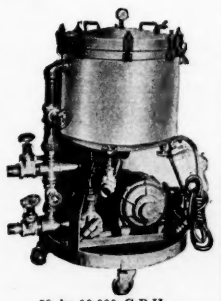
Society for Experimental Stress Analysis, Cambridge, Mass. Booth C-215.
Exhibiting: Literature and publications dealing with experimental stress analysis. One or more models showing various applications of experimental stress analysis.
In attendance: C. Lipson, Chrysler Corp., in charge.

YOU ARE INVITED to test out the Sparkler method of Horizontal Plate filtration on your plating solutions, Drinking Water, Chemicals, Cutting, Grinding and Honing Oils, Lube Oils, Transformer Oils, Sulphinated Oils, etc., and make your own comparisons.

No matter what filter media you are using—plastic cloth, paper, glass cloth, asbestos pads, activated carbon or plain filter aid—any one is used more efficiently, simply and economically on the Sparkler Horizontal Plate.

Sometimes a mere suggestion as to the grade or type of filter media or filter aid makes a big difference. Permit us, through one of our field engineers, to analyze your filtering problems with you.

Send sample of unfiltered product for free filtering analysis—no obligation.



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SPARKLER HORIZONTAL PLATE FILTERS

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Solventol Chemical Products, Inc., Detroit. Booth E-610.

Sparkler Mfg. Co., Mundelein, Ill. Booth I-626.
Exhibiting (in operation): One operating unit Model No. 8-3 laboratory filter with glass tank demonstrating the theory of the horizontal plate. One production unit Model No. 18-D-8 (not operating).
In attendance: A. C. Kracklauer, general manager and partner; Wm. J. Kracklauer, sales manager and partner; H. Corrodi, Ohio sales and service engineer; J. C. Lally, Pennsylvania sales and service engineer.

Spencer Turbine Co., Hartford, Conn. Booth B-118.
Exhibiting (in operation): The Spencer multi-stage centrifugal type turbo-compressor used for atomizing and low combustion air for oil and gas-fired furnaces. Also industrial type vacuum cleaners for handling wet and dry material.
In attendance: F. A. Wright, special representative; C. S. Gardiner, R. B. Richardson, and G. B. Houliston, sales representatives; R. A. Brackett, sales manager.

Sperry Products, Inc., Hoboken, N. J. Booth B-414.

Standard Alloy Co., Cleveland. Booth D-410.
Exhibiting: Industrial furnace conveyor belt; industrial furnace rolls, centrifugal cast; salt, cyanide and lead melting pots; carburizing boxes; annealing trays; chain; miscellaneous type furnace parts.
In attendance: H. M. Smith, president; P. G. Lutz, vice-president; F. P. Morrow, sales manager; C. B. Jackson, field superintendent; R. E. Forsyth, Detroit representative; K. J. Reardon, Chicago representative; L. W. Haag, steel mill representative.

Standard Oil Co. (Ohio), Cleveland. Booth B-609.
Exhibiting: Various types of cutting, drawing, grinding and honing lubricants which have been used so successfully during the peak production period. Also certain types of equipment of unusual interest, some of which may be in operation. Information on all types and phases of machine tool operation and products that will be required for post-war needs.
In attendance: M. R. Bower, industrial sales manager; C. W. Rupert, H. W. Johnston, J. H. Allison, G. H. Black, F. R. Need, E. G. Gott, G. C. Svatos, W. H. Foster, G. S. King, M. S. Obenauf, J. A. Lindsay, E. C. Binder, S. H. Davis, K. M. Howell, C. B. Sears, D. S. Bruggeman, J. H. Wieland, J. J. Adams, H. Gillett, J. Baadte, H. A. Humiston.

Standard Steel Spring Co., Coraopolis, Pa. Booth S-170.
Exhibiting (in operation): Installation of a laboratory size (30 in. by 17 ft.) Corronizing plating line in operation to show the full sequence of the Corronizing process with electrical controls, heat treatment, etc. Also display of Corronized material both before and after fabrication and tie-ins with national advertising program.
In attendance: R. C. Enos, president; M. B. Hammond, vice-president; C. J. Queenan, vice-president; L. C. Conradi, chief metallurgist; W. R. Munger, sales; Don McGee, advertising; G. B. Bowman, chemist; Franklin Stockton, chemist; J. A. McConaughy, engineer; Damon C. Antel, engineer; J. J. Rohror, mechanical engineer; Clyde Cupps, development engineer.

State Manufacturing & Construction Co., Franklin, Ohio. Booth G-625.
Exhibiting (in operation): State adjustable boring and reaming tools and State adjustable core drills, featuring an exclusive multiple cutter interlocking principle. Velsey Black Granite surface plates featuring an overall flatness accuracy of fifty millionths of an inch (0.00005 in.).
In attendance: Edward A. Mayer, partner; Leo M. Ward, partner; George E. Boullain, chief engineer; Wilbur J. Wright, Cleveland area engineer.

Steel. Booth D-414. (See **Penton Publishing Co.**)

Steel Publications, Inc., Pittsburgh. Booth H-622.
Exhibiting: Technical business papers.
In attendance: Don N. Watkins, president; N. R. Moll, executive vice-president; H. Milton Reich, vice-president in charge of sales; Charles Longenecker, vice-president in charge of editorial; W. N. Robinson, editor; F. B. Yeager, field representative; T. B. Little, eastern representative.

Sterling Alloys, Inc., Woburn, Mass. Booth B-115.
Exhibiting: Specially designed alloy heat treating fixtures and castings used in ordnance plants. Photographs of heat and corrosion resistant castings. A historic chart display showing complete A.S.M. national office history from 1918 to date—officers, convention data, etc.—and comparable chart of Cleveland chapter from 1919 to date.
In attendance: G. C. McCormick, president; W. R. Blair, vice-president; H. I. Dixon, sales manager; R. B. Steele, New York City field engineer; T. J. Donovan, Jr., Philadelphia; P. Otto, Springfield, Mass.; W. G. Merowit, Buffalo; J. N. Berger, Pittsburgh; A. F. Tenney, Dayton; C. C. Miller, Detroit; C. L. Robertson, Indianapolis; E. W. Bock, Milwaukee; R. Garfield, Cleveland; H. Steffens, Chicago.

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P. Otto, Springfield, Mass. — H. N. Steffen, Chicago
W. G. Merowit, Buffalo, N.Y. — E. W. Bock, Milwaukee
H. A. McDonough, Cleveland, O. — C. L. Robertson, Indianapolis
A. F. Tenney, Dayton, O.

STERLING ALLOYS, INC.
WOBURN, MASSACHUSETTS
STERLING
Heat & Corrosion Resistant Alloy Castings

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Stevens Grease and Oil Co., Cleveland. Booth I-610.
Exhibiting (in operation): Crystal solid-oils; specialized lubrication for seam and spot welding machines; high temperature and waterproof lubricants (visual demonstrations).
In attendance: C. W. Beck, vice-president; A. Roy Allison, manager, Crystal division; W. N. Demuth, sales engineer; R. I. Patterson, sales engineer; A. L. Gressel, chemist.

Stow Manufacturing Co., Binghamton, N. Y. Booth I-629.
Exhibiting (in operation): Equipment embracing flexible shaft remote operating gear installed in a large model ship; power drive flexible shaft applications; Stow flexible shaft machines.
In attendance: J. P. Dickinson, vice-president in charge of sales, in charge of exhibit.

Strong, Carlisle & Hammond Co., Cleveland. Booth C-234.

Stuart Oil Co., Limited, D. A., Chicago. Booth B-324.
Exhibiting: Unusual oil-machined parts of almost every description. Examples of principal Stuart oils. Printed data on the use of cutting fluids, grinding fluids, drawing compounds, heat treating oils, and lubricating oils and greases.
In attendance: William H. Oldacre, president and general manager; F. J. Schmitt, sales manager; J. E. McCoy, assistant to sales manager; H. A. Erickson, engineer; J. I. Carr, advertising manager; C. H. Baker, W. F. Aske, J. P. Tomlinson, O. M. Gibson, H. W. Schafer, F. W. Smith, J. L. Morosini, F. W. Shute, J. Rodnite, J. Y. Umbarger, C. M. Hopkin, Jr., C. J. Nagel, E. J. Graham, P. Slivinski, G. F. Stanford, W. H. Huelster, and E. B. Gratton, representatives.

Sturgis Products Co., Sturgis, Mich. Booth H-621.
Exhibiting: Sample parts and photographs of equipment.
In attendance: L. R. Davidson, president; D. T. Barrett, secretary-treasurer; F. L. Grim, chemist.

Sunnen Products Co., St. Louis. Booth C-402.

Surface Combustion, Toledo, Ohio. Booth B-608.
Exhibiting: Backwall featuring new developments in applied gas chemistry to heat treatment, prepared atmosphere equipment, standard and special heat treating furnaces and burner equipment.
In attendance: Frank H. Adams, vice-president and general manager; C. B. Phillips, vice-president in charge of sales; H. M. Heyn, sales manager in charge of heat treat division; A. H. Koch, in charge of standard industrial equipment; J. M. Brown and H. T. Gates, sales engineers, Cleveland; C. W. Gale and E. G. Buschow, Pittsburgh; W. F. Herdrich and Edw. Stephenson, Jr., Detroit; W. O. Owen, H. J. Gregg, and G. J. Langenderfer, Chicago; H. O. Bennett, Anderson; W. J. Murray, Syracuse; A. C. Eversole, advertising.

Sutton Engineering Co., Pittsburgh and Bellefonte, Pa. Booth A-640.
Exhibiting (in operation): Descriptive literature covering all branches of straightening equipment both for ferrous and non-ferrous materials. A small model of our most recently developed seven-roll KT type bar and tube straightening machines. The model will be hooked up to a small motor and samples of light wall tubing will be passed through the machine. Universal joints, anti-friction bearing equipped, in five sizes. Hardened and ground straightening machine rolls.
In attendance: J. B. Sutton, president; Ann C. Penny, secretary; O. J. Skawden, chief engineer.

Swan-Finch Oil Corp., New York City. Booth I-621.

Tagliabue Mfg. Co., C. J., Brooklyn, N. Y. Booth C-408.

Tal's Prestal Bender, Inc., Milwaukee. Booth B-403.
Exhibiting (in operation): Motor-driven portable pipe bending machine with ½-h.p. motor.
In attendance: Art B. Doyle, production manager; E. T. Tal, president.

TelAutograph Corp., New York City. Booth C-238.
Exhibiting (in operation): How TelAutograph service speeds and coordinates all phases of production from receipt of raw materials to shipment of final product. Visitors will be allowed to write on the TelAutograph telescribers and see their handwriting reproduced at both sending and receiving stations.
In attendance: J. B. Carlyon, sales manager; S. S. Dewson, Chicago district manager; Alice Honore Drew, advertising manager; Alfred Fava, assistant to president; H. C. Gamble, Cincinnati branch manager; Whitney Hayes, Pittsburgh branch manager; C. M. Huber, Detroit branch manager; H. A. Lawrence, Cleveland branch manager.

Tempil Corp., New York City. Booth C-117.
Exhibiting (in operation): Display of Tempil products. Apparatus to show how they function.
In attendance: Robert J. Pass, general manager; Howard M. Ward, production manager; Gerald M. Wolten, research director.

Tennant Co., G. H., Minneapolis. Booth S-112.
Exhibiting (in operation): Models K and J floor machines which are designed for heavy and difficult cleaning operations. They incorporate the use of a steel wire brush which shears dirt from the floor and automatically picks it up in one operation. A powerful vacuum system controls dust; metal chips, oily sludge, and heavy dirt collect in hopper.
In attendance: Orville C. Hognander, sales promotion manager; W. L. Wiegman, John Hugh Kelley, and Robert H. Baldwin, district managers.

Texas Co., New York City. Booth B-425.
Exhibiting: Petroleum lubricants featuring cutting fluids and a table display of machined parts.
In attendance: F. M. Pobst, chief engineer, Indianapolis district; W. C. Lockwood, technical division, New York; J. P. Dryer, C. M. Wescott, and F. D. Corcoran, cutting oil engineers, Chicago district; H. E. Nicholson and M. S. Oldham, cutting oil engineers, Indianapolis district; F. C. Kerns, superintendent lubricating sales, New York; N. H. Steindler, chief engineer, Chicago district.

. . . Who Will Be in Attendance What They Will Exhibit . . . .

Exhibitors—

Tinnerman Products, Inc., Cleveland. Booth I-617.
Exhibiting (in operation): Speed nuts and clamps.
In attendance: G. A. Tinnerman, Wm. M. Buttriss, Carl Kasper, C. L. Judd, T. O. Dahlstrand, R. A. Hartman, R. Smith, J. Kurt.

Torit Mfg. Co. Booth A-620. (See **H & H Research Co.**)

Towmotor Corp., Cleveland. Booth F-605.
Exhibiting (in operation): One Towmotor Fork Lift Truck Model LT-44 and one Towmotor Fork Lift Truck Model LT-50.
In attendance: C. E. Smith, vice-president and sales manager; E. R. Wallace, district sales representative; W. L. Utley, assistant to sales manager; A. I. McClelland, sales department; John F. Anderson, assistant sales promotion manager; Dan Wessman, service manager; Edward Southworth, sales promotion manager.

Trent Co., Harold E., Philadelphia. Booth I-611.
Exhibiting: New laboratory furnace; new high temperature furnace for high speed steel; laboratory equipment; hot plates; industrial equipment.
In attendance: Harold E. Trent, president; E. F. Ewing, sales manager; O. N. Jones and H. C. Martin, Cleveland; R. E. Brown and F. W. Fisch, Pittsburgh; Geo. R. Horne and W. C. Oberhauser, Detroit; M. J. Cleary and C. J. Sampson, St. Louis; Roy M. Nelson, Chicago; Stanley L. Currier, Cincinnati; Wm. G. Merowit, Buffalo; D. C. Griffiths, R. H. McOuat, and D. P. Williams, Florida.

Trent Tube Mfg. Co., East Troy, Wis. Booth B-203.
Exhibiting: Tubing.
In attendance: F. E. Elge, W. Nickels.

Tri-Clover Machine Co., Kenosha, Wis. Booth B-203.

Troy Stainless Steel Products Co., East Troy, Wis. Booth B-203.
Exhibiting: Bends, fittings, fabricated parts.
In attendance: C. J. Mader, F. Clark.

Tyler Co., W. S., Cleveland. Booths C-413 and D-412.
Exhibiting (in operation): Heat and acid resisting baskets and fixtures. Samples of industrial wire cloth. Operating display of Niagara screening machine showing separation of shot for use in shot peening process. Tyler Ro-Tap testing sieve shaker with various testing sieves (operating display).
In attendance: M. S. Brandt, H. E. Brown, S. M. Grant, C. A. Jenks, and C. F. Miller, Cleveland; P. W. Combs, Detroit; J. H. Holstein and N. C. Ruggie, Chicago; D. V. Vigneron, Philadelphia; John Haig, New York City; Ned Menzies, Seattle; C. A. Schiring, Boston; A. D. Busch, St. Louis; E. M. Graham, San Francisco; R. A. Dorner, St. Catharines, Ont.

Udylite Corp., Detroit. Booth D-628 and D-632.
Exhibiting (in operation): Udylite full automatic electroplating machine. The machine automatically processes parts through the various cleaning, rinsing, buckling, plating, and drying tanks.
In attendance: L. V. Nagle, vice-president; J. V. Davis, chief engineer, Wm. Young.

Ultra Lap Machine Co., Detroit. Booth D-604.
Exhibiting (in operation): Lapping machines; Ultra universal finishing machine.
In attendance: N. Walker, president; B. C. White, vice-president; H. W. Muellenhagen, service manager.

Union Steel Products Co., Albion, Mich. Booth P-526.
Exhibiting: Handling baskets and fixtures for production, degreasing, washing, heat treat, etc. (per customer's specifications). Also fabricated wire and sheet metal parts.
In attendance: C. T. Hatch, vice-president and chief engineer; P. C. Ewbank, plant manager; C. A. Brunner, plant engineer; I. P. Nelson, eastern district sales manager; R. H. Deal, western district sales manager; R. L. Swartwout, manager industrial handling sales, in charge of exhibit.

United Chromium, Inc., New York—Detroit—Waterbury. Booth H-636.
Exhibiting: Metal articles finished by various Unichrome processes including Unichrome copper, Anozinc, Unichrome dip coatings for zinc and cadmium, Electrocolor, and chromium. Information regarding Unichrome products such as Unichrome stop-off compounds and lacquers, Unichrome plating rack coatings, and Unichrome protective coatings including Ucilon, and lacquers of both air dry and baking type.
In attendance: H. D. McLeese, sales manager; T. G. Coyle, technical director; L. A. Critchfield, R. J. Wooley, C. H. Eldridge, R. H. Dudley, E. N. Riotte.

United States Hoffman Machinery Corp., New York City. Booth A-636.
Exhibiting (in operation) Model I-12V self cleaning, coolant filter; Model I-3V for standard grinders, filter for honing machines, etc.
Non-operating: Model A-50 vacuum still for recovery of mineral spirits; Model I-10S pressure filter for oils, wash solvents, etc.; Model RSC, coolant cooling unit for thread grinders, etc.
In attendance: E. R. Clark, manager, filtration division; F. J. Armstrong, chief engineer, filtration division; and C. A. Wallace, C. I. Wallace, A. J. Sanders, J. C. Besler, G. C. Bennett, W. G. Parry, R. W. Strickland, and J K. Schwarzer, filtration division; C. Ridgly Lee, Jr., sales manager.

United States Stoneware Co., Akron, Ohio. Booth H-640.
Exhibiting (in operation): Two separate divisions of stoneware activities: (A) Materials and equipment for metal plating and finishing, with particular emphasis being placed on the various Tygon synthetic materials, such as paint, masking materials, hook and rack coatings, plating tanks, anodes. (B) Reanite and other specialized adhesives for joining metals to wood, rubber, plastics and other materials.
In attendance: J. M. W. Chamberlain, president; H. S. Farkas, vice-president and sales manager; Ray W. Grace, assistant sales manager; D. F. Siddall, director of research; Larry Wybel, J. S. McKenzie, and Paul Strahl, sales.

Universal-Cyclops Steel Corp., Bridgeville and Titusville, Pa. Booth G-605.
Exhibiting: High speed, alloy and carbon tool steels, stainless steels and specialties.
In attendance: J. O. Rinek, vice-president; Frank Garratt, vice-president and technical director; C. T. Evans, vice-president; W. J. Long, assistant general sales manager; N. I. Stotz, assistant general manager—Cyclops Division; H. E. Replogle; Rufus W. Snyder, metallurgist; H. O. Schultz, metallurgist; C. T. Evans, Jr., metallurgist; O. Zmeskal, research metallurgist; H. R. Reese, Cleveland district sales manager; Wilson Kinsey, Cincinnati district sales manager; B. A. Weed, Cleveland sales.

Upton Electric Furnace Division, Commerce Pattern Foundry & Machine Co., Detroit. Booth I-625.
Exhibiting (in operation): One new sealed-type electrode Upton Electric salt bath furnace. Salt bath heat treating and brazing of aluminum, copper and steel parts.
In attendance: E. J. Rousseau, president; Richard C. Upton; E. E. Cloutier, comptroller; Ernest F. Elliott, sales manager; R. C. Stewart, Canadian district representative; Frank K. Ziegler, Chicago representative; Roy E. Lynd, Buffalo representative; Lombard Smith, California representative.

Van Der Horst Corp. of America, Cleveland. Booth C-425.
Exhibiting: Porus-Krome processing on the bore of internal combustion engine cylinders.
In attendance: George H. Lieser, sales engineer; Wayne M. Carleton, market planning manager.

POROUS-KROME

when applied to cylinder bores by the Van der Horst process makes them really

Good for the Life of your Engines

These are just a few of the many sizes and types of cylinder liners which are being processed by Van der Horst. Thousands upon thousands of similar cylinders have been treated with Porus-Krome during the last 4 years.

See for yourself in our exhibit at the METALS SHOW, Booth C-425, just why Porus-Krome is so successful. The Spencerscope will give you an "inside" view of cylinders treated with Porus-Krome.

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Vascoloy-Ramet Corp. Booth P-522. (See **Fansteel Metallurgical Corp.**)

Washington State of, Seattle, Wash. Booth D-603.

Wayne Foundry Co., Detroit. Booth H-608.

Welding Engineer Publishing Co., Chicago. Booth D-329.
Exhibiting: Copies of *The Welding Engineer*, *The Welding Encyclopedia* and other books published by the Welding Engineer Publishing Co. Various pictures, charts and graphs will show the part that welding is to play in the post-war reconversion and production plans.
In attendance: G. H. Mackenzie, president; T. B. Jefferson, editor; C. B. Clason, associate editor; D. R. Watson, midwest advertising representative; T. E. Depew, eastern advertising representative; R. L. Simon, promotion manager.

Wellman Co., S. K., Cleveland. Booth D-150.
Exhibiting (in operation): Metal powder products; friction materials (clutch facings and brake linings) bearing, etc.
In attendance: S. K. Wellman, president; J. R. Nurney, executive vice-president; W. E. Canfield, vice-president in charge of sales; C. D. Heiser, director of public relations; T. A. Novotney, laboratory manager; Don Coleman, assistant sales manager; W. H. Weiss, Cleveland branch manager; H. L. Kinney, manager, industrial department; E. N. Brownell, manager, machine tool department; R. B. Aufmuth, N. M. Lawless, F. J. Lowey, and S. E. Truesdell, project engineers.

Wells Manufacturing Corp., Three Rivers, Mich. Booth D-611.
Exhibiting (in operation): Horizontal and vertical metal cutting band saws.
In attendance: A. E. Armstrong, president; W. F. Wells, vice-president; F. R. Judd, secretary-treasurer; R. W. Bowers, general manager; J. E. Worline, purchasing agent; V. L. Beckle, sales assistant; Eugene VanLoo Jr., service engineer; Rex Orr, factory service; M. H. Worline, F. B. Hagenbuch, George Wells, and A. H. Turnbull, field engineers.

Western Metals, Los Angeles. Booth A-625.
Exhibiting: Display material on the metal working industries of the eleven western states, as well as a supply of the current issue of *Western Metals*.
In attendance: Jay Jenkins, publisher; L. V. Hohl, eastern manager; David Carmen, midwest manager.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. Booth B-340.
Exhibiting (in operation): Industrial X-ray; high frequency heating units; Phos-Copper brazing; Hipernik; Cupaloy; electric furnace consultation.
In attendance: J. B. Seastone, manager feeder engineering; W. A. Graham, feeder engineering; J. H. Germany, manager heating section; L. H. Gillette, J. F. Baker, and C. E. Beck, heating section; L. M. Gumm, manager steel mill and metal working section; C. B. Stainback, manager industrial department; W. C. Eakin, industry application department; John Hoop, generating engineer; C. S. Eason, manager X-ray application department; Edw. Moran, assistant manager X-ray application department; A. W. Koch, manager Chicago X-ray; P. H. Grunnagle, manager of exhibits.

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METAL SHOW

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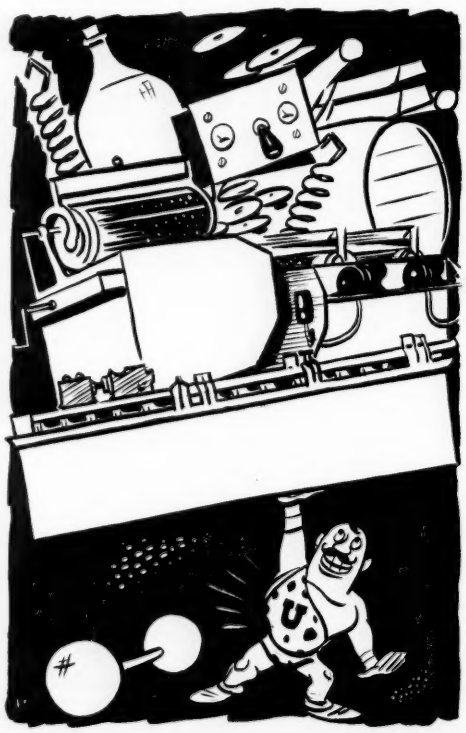

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Yes sir! if it's used in metal finishing you'll find it at Udylite. Our well engineered line of equipment is complete, from the compact, new full automatic to the smallest switch or test set. Our supplies are the finest you can buy for the job. All carefully tested in our own laboratories and in actual production before we offer them to you.

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Representatives in all principal cities.

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Whalley Co., George, Cleveland. Booth C-229.
Exhibiting: Metal shop equipment—sample bench, shop pans, stock cart, tool stand, foreman's desk, drill and reamer rack, cabinets, shop stools, tool box. Display boards containing machine cutting tools, as well as clamps, jigs, and accessories, turret heads.
In attendance: George Whalley, president; Victor G. Whalley, vice-president; Vernon Verchio, warehouse manager; Julia Csokmay, secretary; Helen Whalley, saleslady; William Morgan, salesman.

Wheelco Instruments Co., Chicago. Booth C-138.
Exhibiting (in operation): Wheelco Potentiotrol, Limitrol and Throttltrol in actual operation on gas fired furnace. Wheelco Capacitrol and Automatic Inputrol in actual operation on electric furnace. Demonstration of Flame-otrol and recording thermometer—Flame-otrol combination. Display of Chronotrol and indicating and portable pyrometers.
In attendance: R. A. Schoenfeld, vice-president and general manager; T. A. Cohen, vice-president and director of research; Chas. L. Saunders, vice-president and eastern manager; A. H. Kruger, application engineer; J. C. Freyberg, public relations; Clarke Joy, Cleveland district manager; C. L. Clark, Detroit district manager; Earl E. Whitaker, Pittsburgh district manager; W. L. Wallingford, Cincinnati manager; M. H. Wilson, Toronto manager; M. K. Whiting, Cleveland sales and service; W. J. Olson, Buffalo manager; C. W. Lugar, Indianapolis district manager.

STRAIGHT LINE CONTROL FOR ELECTRIC FURNACES

by

WHEELCO

The Wheelco Inputrol, a recent addition to the Wheelco Line, is designed to carry the accuracy of your pyrometer controller right through to the heating apparatus itself, with resulting closer control than possible with a pyrometer alone. It is a precision instrument which automatically adjusts electrical input to the requirements of the apparatus controlled, by varying the time of ON—OFF ratio.

The Inputrol is also used on fuel fired systems where it is necessary to control flame length and fuel/air ratios within close limits.

If you must have the ultimate in control, request Inputrol Bulletin J403.

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Creators of "Electronic Principle" Temperature Control

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Wiegand Co., Edwin L., Pittsburgh. Booth E-605.

Williams and Co., Inc., Cleveland. Booth B-431.
Exhibiting: Directory of products.
In attendance: J. H. Penske, Jr., district manager; D. J. Connelly, A. B. Kibby, H. F. Roberts, R. C. Harrison, G. J. Schmidt, R. C. Whitney.

Willson Products, Inc., Reading, Pa. Booth G-613.
Exhibiting: Safety goggles; MonoGoggles; face shields; dust respirators; gas masks; welding goggles; welding helmets; air analysis instruments; a full line of eye protection equipment for industry.
In attendance: S. C. Herbine, sales manager, industrial district division; W. D. Gross, and C. N. Harrison, industrial distributors' division.

Wilson Mechanical Instrument Co., Inc., New York City. Booth C-134.
Exhibiting (in operation): Improved models of the Rockwell hardness tester and the Rockwell superficial hardness tester; also the Tukon tester and Knoop indenter. A complete line of accessories for these instruments.
In attendance: V. E. Lysaght, sales manager; J. B. Verrier, assistant sales manager; C. H. Thompson, Ohio-Pennsylvania representative; C. W. Smith, Michigan representative; Paul Fee, Illinois representative; J. L. Kavalaris, Indiana representative; Floyd Olin, Western New York representative; S. P. Rockwell Co., New England representative; Canadian-Fairbanks Morse Co., Ltd., Canadian representative.

Wood Products Corp., J. R., New York City. Booth B-218.
Exhibiting: Precision castings made by centrifugal process within tolerances of ±0.002 in. Actual castings used without further machining in aircraft and instrument assemblies will be shown.
In attendance: Rawson L. Wood, president; Arthur W. Muller, assistant production manager.

Wright-Hibbard Industrial Electric Truck Co., Inc., Phelps, N. Y. Booth B-206.

Yale & Towne Mfg. Co. Booth G-621. (See **Automatic Transportation Co.**)

Yerges Mfg. Co. Booth F-633. (See **Divine Brothers Co.**)

Zagar Tool, Inc., Cleveland. Booth E-628.
Exhibiting (in operation): One lathe with speed chuck attached. Two milling machines, one with index fixture, one with air-operated holding fixture. One broaching machine. One drill press with one holding fixture. Also table display of holding and indexing fixtures, vertical-horizontal holding fixtures, air-operated holding fixtures and speed chucks; collets and collet pads.
In attendance: Walter Zagar, president; Frank Zagar, vice-president; Leslie Korody, sales manager; Edward F. Dain, Cleveland representative; C. A. Reece, advertising manager.

Specification by Hardenability Unified For 37 Standard Steels

The present tendency toward specifying alloy steels by hardenability as an index of tensile strength, rather than by chemical composition, is given fresh impetus by publication of a booklet prepared jointly by the Society of Automotive Engineers and the American Iron and Steel Institute entitled "Tentative Hardenability Bands."

This uniform method currently is applicable only to 37 standard fine-grained steels of modified chemistries for which tentative hardenability bands have been published. The steels, identified by customary S.A.E. and A.I.S.I. numbers, plus the code letter "H", include 4100 H from 0.30 to 0.50% carbon; 4340H; 4620H; and the 8600H and 8700H series from 0.20 to 0.50% carbon.

Monarch Aluminum Installs New Equipment

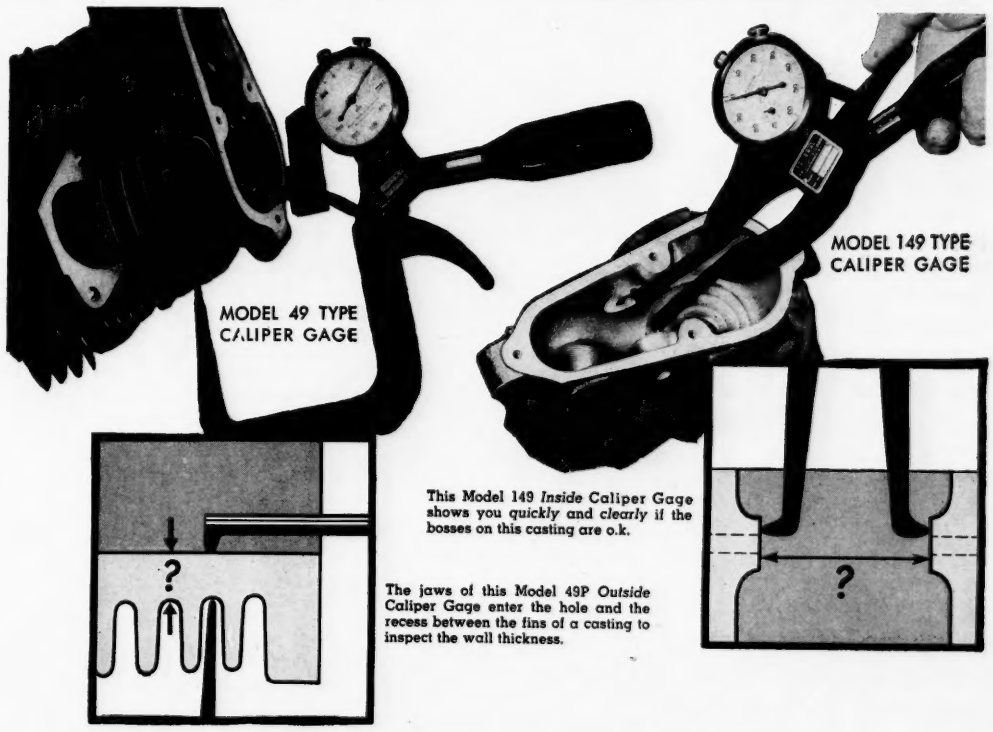
The Defense Plant Corporation has authorized a contract for $145,000, for the installation of modern straight line production equipment in the permanent mold foundry of the Monarch Aluminum Mfg. Co., Cleveland.

The entire modernizing program will provide for the installation of new furnaces, additional controls and other automatic devices. A continuous conveyor belt for the quick handling and inspection of castings is also being installed, and there will be additions to the company chemical and physical laboratories.

Take New Positions

← O. W. McMullan, a past chairman of the Calumet Chapter A.S.M. and formerly in the metallurgical department of Youngstown Sheet & Tube Co., East Chicago, Ind., is now chief metallurgist for Bower Roller Bearing Co., Detroit.

Walter M. Mitchell has been appointed director of research for Mack Trucks, Inc. He was formerly chief metallurgist for the York Safe and Lock Co.'s special ordnance plant producing Bofors anti-aircraft guns for the U. S. Navy. →



This Model 149 *Inside* Caliper Gage shows you *quickly* and *clearly* if the bosses on this casting are o.k.

The jaws of this Model 49P *Outside* Caliper Gage enter the hole and the recess between the fins of a casting to inspect the wall thickness.

The Easiest Way to Inspect
OUTSIDE *and* INSIDE
DIMENSIONS - - - - -

Dimensions do not have to be limited to fine tolerances in order to get a lot of use from these gages. Their greatest value is their convenience — their quick, easy and direct way of getting into odd positions and telling you whether a dimension is right or wrong, and *how much* wrong. The jaws can be made in every conceivable shape to get practically into any position.

The Model 49 *Outside* Calipers and the Model 149 *Inside* Calipers are equipped with Dial Indicators graduated in .01" or 1/64". They can be furnished for comparing dimensions or for direct measurements. Though not high precision instruments, they are exceptionally popular calipers. Their use has saved many times their cost, time and again. It will pay you to use them rather than take a chance on many a job. Use them on patterns, cores, castings, forgings, tubing, shells, bottles, plastics, formed shapes; in fact, any irregular shaped workpiece. Ask us about a gage with jaws designed to fit your work.

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METAL SHOW
OCT. 16th thru 20th
Complete display of various types of DIMENSIONAL CONTROL GAGES

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MANUFACTURERS' CATALOGS IN REVIEW

Heat Reflectance

Preferred Utilities Mfg. Corp.,
1860 Broadway, New York 23, N. Y.

"New Approaches to Surface Protection" is the title of a new pamphlet discussing the highly desirable advantages ascribed to the Preferred preparations, White Hot and Pyro-Chrome. These protective coatings take advantage of properties of heat reflectance, a hitherto overlooked principle by which a substantial amount of radiant heat energy is put back to work, instead of being absorbed by heat chamber linings. A series of new graphs show the relative reflectance values of different colors found in refractories and other heat resisting surfaces. White and green are shown to have the highest heat reflectance properties.

Preferred White Hot, white in color and practical for temperatures up to 2840° F. and Preferred Pyro-Chrome, green in color and capable of withstanding heat up to 4000° F. are both applied like paint. A relatively thin coat penetrating into the material to which it is applied, is intended to form a pore-deep bond, stabilizing the surface, proving highly resistant to heat, corrosion and oxidation and more enduring than thicker coatings of other heat resisting materials, it is claimed.

Mention R526 When Writing or Using Reader Service.

Heat Treating Guide

Carpenter Steel Co., 338 W. Bern St., Reading, Pa.

A new heat treating guide which should prove a great convenience and time saver in the tool room has just been completed by this company. In handy, easy-to-use form it gives complete information on the heat treatment of all Carpenter matched tool steels. At a glance the heat treater can find the following information for each steel: Type analysis, forging heat, normalizing heat, annealing treatment, hardening treatment, furnace atmosphere, and recommended drawing range. In addition, he can determine for each steel on the chart the hardness for various drawing temperatures.

Mention R527 When Writing or Using Reader Service.

Scale Catalog Spotlights "Hidden Losses"

Yale & Towne Mfg. Co., Philadelphia Div.,
4530 Tacony St., Philadelphia 24, Pa.

A new, complete and factual catalog of Kron scales has just been prepared for the use of buyers of precision industrial equipment. This catalog presents the full story of the entire Kron scale line from dormant and portable platform types of special counting, batching, tensile strength and dynamometer models. Fully illustrated with complete specifications and dimensions, it is a valuable reference book.

Mention R528 When Writing or Using Reader Service.

Melting Furnace Catalog

Campbell-Hausfeld Co., Harrison, Ohio

This 40-page catalog describes some twelve types of melting furnaces, including laboratory crucible furnaces, single burner stationary crucible furnaces, crucible aluminum furnaces, tilting crucible furnaces and others. These furnaces are pictured and described comprehensively. Price lists are included.

Mention R529 When Writing or Using Reader Service.

High Temperature Laboratory Furnaces

Harper Electric Furnace Corp., Niagara Falls, N. Y.

This leaflet describes a line of high temperature electric furnaces designed to bring to the laboratory a precision instrument for making accurate high temperature tests. Maximum temperature is 2750° F., with operating temperature of 2500° F.

Mention R530 When Writing or Using Reader Service.

Electrode Specification Chart

Arcos Corp., 401 N. Broad St., Philadelphia 8, Pa.

This new chart supersedes all previous charts of this company and gives the following data on stainless steel and ferritic alloy welding electrodes: (1) Weld metal chemical composition of 42 stainless and alloy electrodes. (2) Heat treatment specifications of the welded structure for the more important stainless and alloy grades. (3) Identifying grade information.

Mention R531 When Writing or Using Reader Service.

Heat Treating Equipment

Michigan Steel Casting Co.,
1999 Guion St., Detroit 7, Mich.

A wide variety of heat treating equipment is described and illustrated in this 12-page booklet. Pictures and specifications are given for dipping baskets, lead, cyanide and salt pots, sheet carburizing boxes, cast and fabricated trays, fabricated and cast fixtures and rolled and fabricated thermocouple protection tubes.

Mention R532 When Writing or Using Reader Service.

Welding Current Heat Controls

Weltronic Co., 19500 W. 8 Mile Rd., Detroit 19, Mich.

This technical bulletin contains descriptions, applications, specifications, and features of the new improved line of package unit heat controls, providing dial-controlled infinitely variable phase-shift regulation of welding current. Models are now available for virtually every resistance welding process including spot, seam, pulsation, butt, flash and forge welding.

Mention R533 When Writing or Using Reader Service.

Motorized Hand Truck

Automatic Transportation Co.,
101 W. 87th St., Chicago 20, Ill.

The "Transporter" is described in this four-page leaflet as a combination of foot-operated hydraulic lift truck with electric power front wheel drive. This equipment is designed for economical and safe lifting and short hauling of loads at safe walking speeds, either on skid platforms up to 6000 lb. by means of the platform type Transporter or pallet unit loads up to 4000 lb. by means of the fork type Pallet Transporter. Standard established platform lengths for the two capacities are 36 in. to 72 in. Standard widths, 20 in. and 26½ in., with heights 6 in., 7 in., 9 in. and 11 in.

Mention R534 When Writing or Using Reader Service.

Handbook of Design Data on Stainless Steel Sheets

The American Rolling Mill Co., Middletown, Ohio.

A new 40-page handbook for designers of stainless steel equipment has been prepared by this company. "Design Data on High Tenside Stainless Steel Sheets for Structural Purposes" gives valuable information for accurately proportioning stronger, lighter aircraft and other equipment parts.

It is said to be the first time that such detailed values for commercial stainless, both above and below the yield point, have been compiled. Test results and discussions deal with Armco High Tensile stainless steel sheets in quarter, half, three-quarter and full hard tempers.

Compression and tension data in the handbook for stainless steel establish minimum values for the designer. These are some of the important subjects it covers: Mechanical properties of the stainless steels and derived design data; some fundamental concepts of design theory to be considered when using stainless steels at the high stresses where they are most effective; stress-strain data from tensile and compressive tests on high strength stainless steel sheets, both above and below the yield points. These data are shown in curve form and pertinent values tabulated; significance of the tangent and secant moduli of elasticity in structural design is illustrated.

Mention R535 When Writing or Using Reader Service.

Storage Battery Welding

Progessive Welder Co.,
3050 E. Outer Drive, Detroit 12, Mich.

In an effort to provide detailed answers to the most commonly asked questions about its new process of welding with storage batteries as a power source, this company has released an illustrated 12-page booklet. Some 35 major questions relating to costs, operation, maintenance, design, and installation, of battery welding equipment as developed for the various forms of resistance welding are answered in this new booklet.

Mention R536 When Writing or Using Reader Service.

Socket Screw Products

Western Automatic Machine Screw Co., Elyria, Ohio

A new 3-page catalog presents complete data on socket head cap screws, set screws, stripper bolts, pipe plugs, hexagon keys and special socket screws, including descriptions of special tests for accuracy of products described. The book also contains valuable information relative to comparative sizes and strength of screws, and other handy technical data.

Mention R537 When Writing or Using Reader Service.

"Sharonsteel Record"

Sharon Steel Corp., Sharon, Pa.

This 18-page June issue of the Record presents many interesting facts about this company and its personnel. It is profusely illustrated with many of the war products made of stainless steel by this company. Production facilities including electric furnace department for the production of high quality aircraft steels are described.

Mention R538 When Writing or Using Reader Service.

Welding Electrodes

Allis-Chalmers, Milwaukee 1, Wis.

A new line of smooth-flowing arc welding electrodes with quiet arc characteristics is described in this new bulletin. The new electrodes, both A.C. and D.C. types, use the standard A.W.S. number and color, simplifying selection and handling. Bulletin includes a price sheet.

Mention R539 When Writing or Using Reader Service.

Closed Circuit Fastraverse System of Press Operation

The Hydraulic Press Mfg. Co., Mount Gilead, Ohio

Bulletin 4400 explains in detail the closed circuit Fastraverse system of hydraulic press operations, a 36-page book of interest to all those who are interested in the modern applications of hydraulics to self-contained, high speed production epuipment. This system provides regulation of both speed and direction of every press ram movement through control of the output of the pressure-generating pump. There is no reversing valve. The pump flow is both variable and reversible, going through zero at each press reversal. Thus press action is said to be fast, yet smooth and shockless. Many pictures are shown to illustrate applications, mode of operation, with diagrams depicting the basic H-P-M closed circuit.

Mention R540 When Writing or Using Reader Service.

More About Victor

Victor Equipment Co.,
844 Folsom St., San Francisco 7, Calif.

In a well-illustrated 36-page booklet dedicated to customers, distributors, stockholders and prospects, this company answers the question, "How complete a service can you render in the field of welding?" The booklet pictures scores of types of welding equipment, describes facilities and applications of one of the largest manufacturers of gas welding and cutting apparatus, selling from coast to coast and abroad.

Mention R541 When Writing or Using Reader Service.

Applied Gas Chemistry

Surface Combustion, 2375 Dorr St., Toledo 1, O.

Research by this company in the use of gases for atmospheres in the heat treatment of metals has made possible metallurgical results of such significance that it goes far beyond the mechanical details of furnace construction, says this four-page leaflet. Today, with the use of SC radiant tube heating elements and prepared atmosphere generating units, metal surfaces are preserved, including both high and low carbon steels and non-ferrous metals.

Mention R542 When Writing or Using Reader Service.

The Metals REVIEW
THE MONTHLY SURVEY AND DIGEST OF WHAT'S NEW IN METALS

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